

# COMMERCIAL CAR JOURNAL

with which is combined Operation & Maintenance

Reg. U. S. Pat. Off.

Entered as second-class matter at the Post Office at  
Philadelphia, Pa., under Act of March 3, 1879

Vol. XLV

Philadelphia, August, 1933

No. 6

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Published Monthly by

## CHILTON COMPANY

Chestnut and 56th Streets, Philadelphia, U. S. A.

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Portland, Ore.—12 Fifth St.

Controlled by United Publishers Corp., 239 W. 39th St., New York;  
FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C.  
STEVENS, Treasurer.

SUBSCRIPTION RATES: United States and United States Pos-  
sessions and all countries in the Postal Union—\$1.00 per year. Canada and  
Foreign—\$2.00 per year. Single copies 25 cents.

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and-Take-Up Locks—and twelve No. 12 Leaf-Type  
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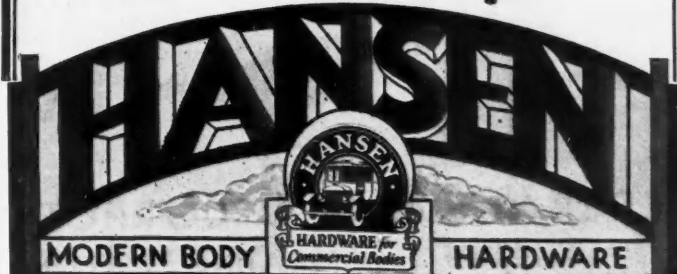
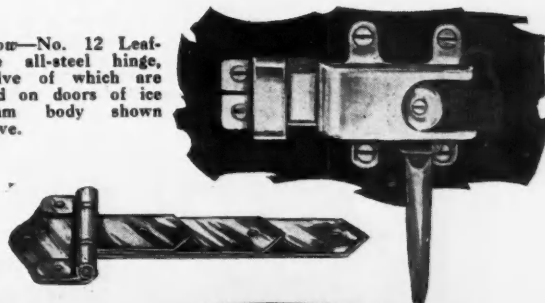
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Below, at right—the No. 66 Slam-and-Take-Up  
Lock, six of which are used on refrigerator  
doors of the General Motors ice cream body  
pictured above.

Below—No. 12 Leaf-  
type all-steel hinge,  
twelve of which are  
used on doors of ice  
cream body shown  
above.





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# RECOVERY IS UP TO ALL OF US

FRANKLIN D. ROOSEVELT, PRESIDENT  
OF THE UNITED STATES OF AMERICA

*Franklin D. Roosevelt*

I HAVE said that we cannot attain prosperity in a nation half boom and half broke. If all of our people have work and fair wages and fair profits, they can buy the products of their neighbors and business is good. But if you take away the wages and the profits of half of them, business is only half as good. It doesn't help much if the fortunate half is very prosperous—the best way is for everybody to be reasonably prosperous.

For many years the two great barriers to a normal prosperity have been low farm prices and the creeping paralysis of unemployment. These factors have cut the purchasing power of the country in half. I promised action. Congress did its part when it passed the farm and the industrial recovery acts. Today we are putting these two acts to work and they will work if people understand their plain objectives.

First, the farm act: It is based on the fact that the purchasing power of nearly half our population depends on adequate prices for farm products. We have been producing more of some crops than we consume or can sell in a depressed world market. The cure is not to produce so much.

Without our help the farmers cannot get together and cut production, and the farm bill gives them a method of bringing their production down to a reasonable level and of obtaining reasonable prices for their crops.

It is obvious that if we can greatly increase the purchasing power of the tens of millions of our people who make

a living from farming and the distribution of farm crops, we will greatly increase the consumption of those goods which are turned out by industry.

That brings me to the final step—bringing back industry along sound lines.

Last autumn, on several occasions, I expressed my faith that we can make possible by democratic self-discipline in industry, general increases in wages and shortening of hours sufficient to enable industry to pay its own workers enough to let those workers buy and use the things that their labor produces.

This can be done only if we permit and encourage cooperative action in industry, because it is obvious that without united action a few selfish men in each competitive group will pay starvation wages and insist on long hours of work. Others in that group must either follow suit or close up shop. We have seen the result of action of that kind

in the continuing descent into the economic hell of the past four years.

There is a clear way to reverse that process: If all employers in each competitive group agree to pay their workers the same wages—reasonable wages—and require the same hours—reasonable hours—then higher wages and shorter hours will hurt no employer.

Moreover, such action is better for the employer than unemployment and low wages, because it makes more buyers for his product. That is the simple idea which is the very heart of the industrial recovery act.

There is nothing complicated about it and there is nothing particularly new in the principle. It goes back to the basic idea of society and of the nation itself that people acting in a group can accomplish things which no individual acting alone could even hope to bring about.

We are not going through another winter like the last. I doubt if ever any people so bravely and cheerfully endured a season half so bitter. We cannot ask Americans to continue to face such needless hardships. It is time for courageous action, and the recovery

(TURN TO PAGE 20, PLEASE)



THE  
PRESIDENT'S PAGE



# NRA RECEIVES TENTATIVE MOTOR TRUCK CODE

Provides for maximum weekly average of 48 hours in any six-month period and guarantees minimum pay of 30 cents per hour in the North and 25 in the South

**A**NXIOUS to do their share in the national recovery program, truck operators convened in Washington on Aug. 10, 11 and 12, formulated a tentative code applying to all types of carriers of property by motor or horse-drawn vehicles under which operators can procure their blue eagles, and organized the Federated Truck Associations of America as the administering body representative of all haulers.

The code conference was attended by 150 representatives of truck associations and industrial groups. Twenty-seven state associations were represented.

The code, a complete copy of which is published here, has been submitted and accepted by the National Recovery Administration for study.

It is expected that other truck codes will be submitted by organizations representing various trucking groups.

In reference to the code submitted the Executive Committee of the Federated Truck Associations of America had this to say:

"In direct accordance with the suggestions of the Recovery Administration the Code covers the special conditions affecting all types of highway transportation.

"Realizing that individual classifications of industry, such as lumber, coal, oil, etc., have submitted codes wherein, because of special conditions, their maximum hours are lower and their minimum rates of pay equal to those suggested in the Commercial Vehicle Code, provision is made in the Commercial Vehicle Code for permitting such specialized industries to operate under their own codes.

"In this manner no individual industry will be handicapped and, conversely, every industry using commercial vehicles will be enabled to spread employment and wages in full accordance with the spirit of the Recovery Act."

A meeting of the Federated Truck Associations of America has been called for Aug. 22 at Washington. Membership in this association is open to all organizations whose membership consists principally of truck owners.

## How to Get Blue Eagle

**W**HEN the Control Board of the N.R.A. passes favorably on the code, blue eagles can be acquired by operators who approve the terms of the code submitted by the Federated Truck Associations of America. The procedure is this: Sign the Certificate of Compliance of the President's Reemployment Agreement with this endorsement: "To the extent of the N.R.A. consent as announced we have complied with the President's Agreement by conforming with the substituted provisions of the Code submitted for the Carriers of Property by Motor or Horse-Drawn Vehicles." Present this to your local Postmaster who will post your name on the Honor Roll and deliver the N.R.A. Blue Eagle.

## Code of Fair Competition of Carriers of Property by Motor or Horse-Drawn Vehicles

### ARTICLE I—Definitions

Section 1. Whenever used in this code or any appendix thereto the terms hereinafter defined shall, unless otherwise clearly indicated by the context, have the respective meanings set forth in this article. The definition of any such term in the singular shall apply to the use of such term in the plural and vice versa.

Section 2. The term "the industry" means and includes the transportation of property over thoroughfares by means of motor or horse-propelled or drawn vehicles, operated for hire or otherwise, used in connection with or incidental to any commercial, industrial or other business activity.

Section 3. The term "member of the industry" means and includes any person, firm, association or corporation engaged in "the industry."

Section 4. The term "private operator" as used herein shall mean one who operates his own vehicles to transport his own property and receives no pay from others for the use of his vehicles.

Section 5. The term "operator for hire" as used herein shall mean one who transports property of others for hire.

Section 6. The term "employee" as used herein shall include all persons employed in the conduct of a business, and especially to the driver of a vehicle if he is the owner or part owner thereof.

Section 7. The term "National Industrial Recovery Act" means such act as approved by the President June 16, 1933.

Section 8. The term "the effective date of the code" means ten days after the date on which the Code shall have been approved by the President pursuant to the National Industrial Recovery Act.

### ARTICLE II—Purpose of the Code

This Code is adopted, pursuant to Title I of the National Industrial Recovery Act, to remove obstructions to the free flow of interstate and foreign commerce which tend to diminish the amount thereof; to provide for the general welfare by promoting the organization of industry for the purpose of cooperative action among trade groups; to induce and maintain united action of labor and management under adequate governmental sanctions and supervision; to eliminate unfair competitive practices; to promote the fullest possible utilization of the present productive capacity of industries; to avoid undue restriction of production; to increase the consumption of industrial and agricultural products by increasing purchasing power; to reduce and relieve unemployment; to improve standards of labor and business conduct; and otherwise to rehabilitate industry and conserve natural resources.

### ARTICLE III—Scope

This Code shall be applicable to all vehicles to the full extent permitted by the National Industrial Recovery Act.

### ARTICLE IV—Hours of Labor, Rates of Pay and Other Conditions

Section 1. Pursuant to sub-section (a) of Section 7 of the National Industrial Recovery Act, and so long as the Code shall be in effect, the Code shall be subject to the following conditions:

(1) That employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint or coercion of employers of labor, or their agents, in the designating of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection;

(2) That no employees and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing; and

(3) That employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved and prescribed by the President.

(4) In accordance with the provisions of sub-sections 1, 2 and 3 of Section 1 of Article IV, the members of this industry propose to continue the open or closed shop policy heretofore followed by such member and under which unusually satisfactory and harmonious relations with employees have been maintained.

(5) The selection, retention, and advancement of employees will be on the basis of merit without regard to their affiliation or non-affiliation with any labor organization or other organization.





Section 2. On and after the effective date of the Code:

(1) The maximum hours for drivers and their helpers and dispatchers shall be forty-eight hours in any one week. Only productive hours shall be considered for loading and unloading. The hours spent by an owner or employee deadheading on a vehicle shall not be considered as working hours.

(2) In consideration of the difficulties attending the supervision of drivers and helpers while en route and of measuring actual performance, the employer may, at his option, determine that all or part of the work done may be measured in terms of scheduled miles on the following ratio of hours to miles: For a tractor, semi-trailer and one extra trailer, 720 miles of travel should be considered equivalent to forty-eight hours of labor; for a tractor and semi-trailer or for a truck and a trailer, 1000 miles of travel shall be equivalent to forty-eight hours of labor; for a straight truck 1200 miles of travel shall be equivalent to 48 hours of labor.

(3) In further consideration of the special conditions connected with this industry, the maximum hours of labor may exceed the maximum set forth herein for any one week; provided, however, that in such case the average number of hours per week for any six months' period shall not exceed the maximum of forty-eight hours per week.

(4) Except employees primarily or wholly in managerial, supervisory or executive capacities who now receive more than \$35.00 per week, employees on maintenance and repair work, outside salesmen or solicitors, watchmen, billing and rate clerks, station managers or employees on very special cases where restriction of hours of highly skilled workers would unavoidably reduce service and except drivers and their helpers provided for under sub-sections (1), (2), and (3) of this Section 2, no office or other employee shall be caused or permitted to work for more than forty hours in any one week, and no subscriber to the Code shall reduce the hours in any establishment or service operation to below fifty-two hours in any one week, unless such hours were less than fifty-two hours per week before July 1, 1933, and in the latter case shall not reduce such hours at all.

Section 3. After the date of the employment of any member of the industry of any employee, such member shall not knowingly permit such employee, who shall have performed work for one or more other employers, to work for such member such number of hours, or their equivalent as provided in sub-section (2) of Section 2 of this Article IV as will result in a violation of the Code had all such work been performed for such member.

#### Section 4.

(1) The provisions of this Article IV regarding maximum hours may be adjusted to conform with maximum hours of different competitive forms of transportation agencies which are under the supervision of the Interstate Commerce Commission, Public Utility Commissions, and/or such governing regulatory bodies as may exist.

(2) The provisions in Article IV as to hours of labor and wage do not apply to private trucks that come under an individual code where both the maximum hours are not more and the minimum wage of that Code not less than provided herein.

Section 5. No member of the industry shall knowingly employ in or about its establishment or operations in the industry any person under sixteen years of age, except that persons between fourteen and sixteen years of age may be employed (but not in manufacturing or mechanical processes), for not to exceed three hours per day and those hours between 7 A. M. and 7 P. M. in such work as will not interfere with hours of day school.

Section 6. Until changed by amendment to the Code, no member of the industry shall pay to any of the classes of employees subject to the provisions of Section 2 of this Article IV less than forty cents per hour unless the hourly rate for the same class of work on July 15, 1929 was less than forty cents per hour in which latter case not to pay less than the hourly rate on July 15, 1929 and in no event less than thirty cents per hour in the North and twenty-five cents per hour in the South. It is agreed that this paragraph establishes a guaranteed minimum rate of pay regardless of whether the employee is compensated on the basis of a time rate or on a piece-work performance.

Section 7. No member of the industry shall use any subterfuge to frustrate the spirit and intent of this agreement which is, among other things, to increase employment by a universal covenant, to remove obstructions to commerce, and to shorten hours and to raise wages for the shorter week to a living basis.

#### ARTICLE V—Unfair Practices

The following shall apply to operators of vehicles used for the transportation of property:

Section 1. It shall be an unfair trade practice to transport property at less than reasonably compensatory rates and charges except for a recognized charitable organization and it shall further be deemed an unfair trade practice for a private operator of a motor vehicle, dray or team who shall not include in his element of cost such sums for his own service as would correspond to the standard wage for like service of an employee doing similar things, if such things were done by an employee coming within the scope of this Code.

Section 2. It shall be unfair trade practice to give secret rebates or settlements, to obtain business by the use of commercial bribery, to make any discrimination in the charge as between different shippers or consignees of the same commodities, which difference is not measured by differences in the costs in performing services.

Section 3. Violation by any operator of vehicles used for the transportation of property of any provisions of this Code, or of any amendments hereto, is hereby declared to be an unfair trade practice.

#### ARTICLE VI—Prior Contracts

Where the costs of executing contracts entered into prior to the approval of this Code are increased by the application of this Code under the National Industrial Recovery Act, it is equitable and promotive of the purposes of this Act that appropriate adjustments of such contracts to reflect increased costs be had.

#### ARTICLE VII—Administration

For the purpose of administering the provisions of this Code and of aiding in the administration of the National Industrial Recovery Act, the Executive Committee of the Federated Truck Associations of America is hereby authorized and empowered to perform any functions and exercise any power necessary to carry out the provisions of this Code, to obtain the approval of the same by the National Recovery Administration, to receive as appendices to this Code and obtain the approval thereof of codes for classified or regional divisions of the industry, to fix the pro rata share of the amounts to be borne by those participating in this Code required to defray the expenses of the administration of its provisions, and to do any and all things necessary or incidental to the carrying out of the provisions of this Code.

#### ARTICLE VIII—General

Section 1. No provision of this Code shall be interpreted or applied in such a manner as to (a) promote monopolies; (b) permit or encourage unfair competition; (c) eliminate or oppress small enterprises; or (d) discriminate against small enterprises.

Section 2. This Code or any of its provisions may be cancelled or modified and any approved rule issued thereunder shall be ineffective to the extent necessary to conform to any action of the President.

Section 3. In order to provide data necessary for the administration of the National Industrial Recovery Act, and the carrying out of the provisions of this Code, the members of this industry shall furnish statistical information as required to the agency authorized in this Code.

#### ARTICLE IX—Effective Date and Termination

The provisions of the Code shall become effective and binding upon all those participating in the Code ten days after approval of the Code by the President and shall remain in effect until and for sixty days after Title I of the National Industrial Recovery Act shall have ceased to be effective either by expiration under its terms or by proclamation of the President. When so terminated, all obligations and liabilities under the Code shall cease, except those for unpaid dues and assessments theretofore made in accordance with the provisions of the Code.

#### ARTICLE X—Amendments

This Code may be amended at any time by those participating therein in the manner determined by them.

# MR. COLLINS PROPS HIS REPLACEMENT PLAN



By W. T. COLLINS

Assistant Economist  
R. H. Macy & Co., Inc.,  
New York City

**W**HEN I prepared my article for the May number, I was aware that there were some aspects of the subject which had not been presented. I purposely ignored them inasmuch as I did not wish to obscure the reasoning behind the general solution for the economic point. However, the discussions which have resulted from that article have been so friendly and constructive and have evinced so much interest in the subject that I am glad of the opportunity to discuss these other phases. I want to express my appreciation to those men who have spent time and thought in discussion of the problem.

Previously it was shown that the economic point for replacement of a motor truck is that point at which the truck has given the greatest value for the total dollars expended; or in other words, when the total cost divided by the number of miles traveled is a minimum. To determine this minimum requires that one continuously add up all the amounts of money expended on a truck, including initial cost (less trade-in value), repairs, gasoline, oil and tires, and then continuously divide these sums by the number of miles traveled from the purchase of the truck until the time each sum is calculated. This gives the cumulative total cost per mile. It has already been shown that when the cumulative total cost per mile ceases to decline, the truck should be disposed of.

To facilitate in the determination of the point at which the cumulative total cost per mile ceases to decline, the behavior of each component part making up the total was studied separately. The gasoline, oil, and tire components were shown to be constant. The investment component and the maintenance component were the only ones exerting any influence. The former was a smooth curve of the general equation  $y = \frac{k}{x}$  and the latter was shown to be represented best by a straight line passing through the origin. It is about the shape of the maintenance component that the important controversy arises.

It should not be surprising that the

• In this article Mr. Collins deals with some of the elementary points in his replacement plan which he purposely ignored in his May article.

• Mr. Collins also takes up some of the contentions raised in the discussion published in July and answers them.

• And in his conclusion he makes a startling statement in regard to accounting practices. Accountants will probably disagree with him. Fleet operators may not.

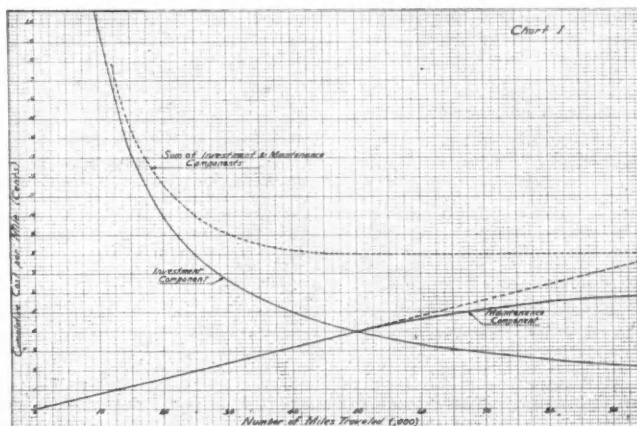
shape of the maintenance component is the center of intelligent disagreement. It is almost the only component which is influenced by that very bothersome factor known as the human element. In fact, the maintenance component is the key to the whole problem. It may be almost any shape depending upon the amount of attention given to the truck. It is one's policy to keep his equipment in fine condition, the economic point is reached more quickly than if he does not mind much about the condition so long as the truck runs. If one is satisfied to drive around in a dilapi-

dated old buzz-wagon, the maintenance component will be small, the cumulative total cost per mile probably low, and the economic point not reached until the truck disintegrates on the road. On the other hand, if it is one's policy to keep his equipment positive and safe and to present a satisfactory, business-like appearance to his clientele, the maintenance component will rise as the mileage increases, the cumulative total cost per mile will probably be larger and the economic point reached much sooner. This merely means that no matter what conditions are to be maintained, so long as they are predetermined, the solution for the economic point follows automatically.

It should be obvious that unless a truck is maintained in about the same conditions as when it was new, the quality of the mileage is not the same; it becomes poorer and poorer as the truck is allowed to run down. This process probably results in a low cumulative total cost per mile. If one is satisfied with the quality of such mileage, all well and good. It should be clear, however, that it is an extreme luxury and a waste for such a person ever to have a new truck. All the miles run while the truck is in excellent condition are too high grade for the job. It would probably be cheaper to buy used equipment and run it into its grave.

(TURN TO PAGE 36, PLEASE)

Chart A



# WHAT'S THE ECONOMIC LIFE OF A TRUCK



By J. F. WINCHESTER

Supervisor of Motor Equipment  
Standard Oil Company  
of New Jersey

**M**R. W. T. COLLINS was kind enough to discuss the paper which he presented in the COMMERCIAL CAR JOURNAL, with me some time ago.

As you know, I have been an ardent advocate of individual cost records for fleet operation, and these thoughts were fundamentally based upon many of the facts contained in Mr. Collins' review of economical truck operation.

There are many other factors to consider aside from those set forth by Mr. Collins, yet a true guide to the average operation of a piece of equipment can be found in the analysis made by Mr. Collins.

By F. C. FIECHTER

Fleet Manager

John Wanamaker, Philadelphia

**T**HE article as prepared by Mr. Collins has been splendidly done, so far as the illustration of his theory on the subject of truck replacements is concerned. It is interesting since it furnishes several constructive formulas for ascertaining certain economic factors in operation.

On several occasions in recent years, I have devoted considerable time and effort to ascertain the terminal point of economic operation of motor vehicles. Several of my procedures were quite similar to those used by Mr. Col-

• Seven well-known fleet men and transportation engineers here give their views on this important subject. These views are part of the discussion of the article, "When Total Cost Per Mile Ceases to Drop, Replace the Truck," by W. T. Collins, assistant economist, R. H. Macy & Co., New York, published in the May issue.

Views of other fleet and factory men will be published in the September issue. Considered as a whole, these opinions constitute the most interesting discussion of the truck replacement subject published to date because they reveal the many, varied factors involved which tend to complicate the working out of a universally acceptable solution.

lins but never had I a sufficient courage of my own convictions to even suggest applying my theories to our own operations, since it had been quite impossible to have my theories substantiated in practice except but in a few instances.

You and the members of your staff are quite familiar with our present method of cost accounting in so far as our fleet operations are concerned. Also you are, of course, aware that our average costs for the various makes and types of equipment are considerably below that established by the manufacturers, in spite of the fact that most of the newer equipment has accrued over 40,000 miles each, and in many instances the older equipment has well over 150,000 each to their credit.

In view of the above facts, I shall refrain from going into a lengthy discussion of our methods, etc., but desire to add that since there are so many variables entering into each individual owners' operating conditions, both within and beyond control, it would be very difficult to design a yard stick for ascertaining the economic point, and were it entirely feasible to do so, most everyone indirectly concerned would take exception to the rule for obvious reasons.



By W. J. CUMMING

General Superintendent  
Surface Transportation Corp.  
of New York

**T**HE reaction of our organization to the article by Mr. W. T. Collins, would indicate a certain degree of inexperience as a practical operator of automotive vehicles and a thorough disbelief in preventive maintenance.

In our own scheme of preventive maintenance, our cost curve is practically constant, although broken, for by experience we are able to predict mileage life of units and since at overhaul, weak design has been studied and is corrected, a reduced maintenance figure is often obtained.

Again briefly, the investment curve published could not agree with our experience, for, as is often the case, our vehicles are as valuable to us today, under present circumstances, as they were when purchased. The only factors that would lessen their value to us, would be radical changes in our transportation scheme or sweeping design changes in transportation vehicles.

By H. R. HOLDER

Superintendent, Autobus Dept.  
Montreal Trainways Co.

**I** HAVE read with a great deal of interest the article on truck retirement by Mr. Collins and although this may be quite applicable to trucks the use of it for passenger-carrying vehicles is to my mind another story.

In the first place increased mileage costs due to the age of a vehicle are practically always the result of delayed maintenance which is always costly, this should not be permitted in passenger transport as the patron purchases his ride and is entitled to be carried with the least possible chance of delay.

In any well-organized transport system the maintenance costs should follow an almost straight line after the first 10,000 or 20,000 miles and there is no reason why a vehicle should not operate economically for a number of



years with a large accumulated mileage providing that maintenance is closely kept up and spare parts can be obtained.

As an illustration of my contention we have coaches that have run over the 300,000 mile mark which are as good today as originally which are not costing us any more (in some cases less) than when new.

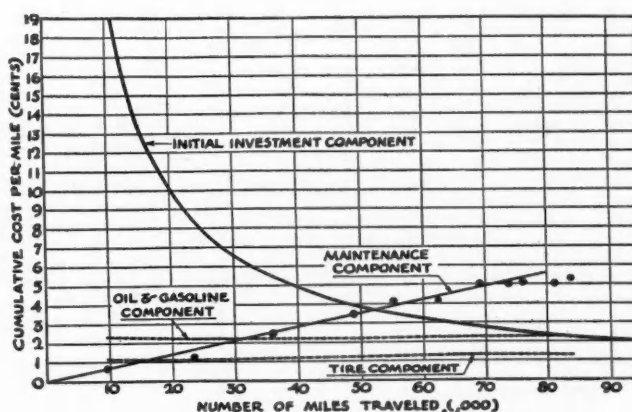


By **M. C. HORINE**  
Sales Promotion Manager  
Mack-International Motor  
Truck Corp.

I HAVE carefully read the thoughtful and intriguing article by Mr. W. T. Collins, which appeared in the May issue of the *COMMERCIAL CAR JOURNAL*. With the main proposition which Mr. Collins' article propounds there can be no argument. The time to replace a motor truck is the time when such a course results in lower total operating cost than a continuance of the old vehicle in operation. There is undoubtedly a great deal of virtue in Mr. Collins' clever simplification of the problem by elimination of those items which are not subject to great change at different periods of the truck's life. Whether the two components, initial investment and maintenance, are adequate for determination of the economic point remains to be seen.

At the outset it is to be observed that the factor of obsolescence is entirely ignored. This is due doubtless in some measure to the fact that Mr. Collins' viewpoint is necessarily that of an operator of light delivery vehicles. Aside from style considerations, it is certainly fair to say that in the department store field obsolescence has not so far proven an important factor. In other fields of transport, however, obsolescence must be given consideration. As against this, however, it might fairly be contended that the experience of the past several years is not a safe guide for the future. The two greatest obsolescence influences during the past five years have been the virtual replacement of solid

Collins Chart 1



tires by pneumatic tires and the general raising of the performance standards. Now that the pneumatic tire is in almost universal use and the performance has been raised to or beyond the optimum limit, these influences will no longer be felt. Furthermore, the accelerated tempo of modern transport, with the resultant greatly increased annual mileage, makes all forms of obsolescence less important, because a given mileage life is run out in a shorter space of time.

Mr. Collins' conception of the initial investment components as a more or less hyperbolic downward curve is unconventional to say the least and certainly will not do as a basis for amortization of the investment. It tends to present a false picture of operating costs. For practical accounting purposes, it would seem preferable to assign a more or less definite mileage life to the vehicle and amortize the investment at a uniform rate per mile, this rate being the quotient of the original investment less tires divided by this mileage. Amortization plus interest therefore becomes a fixed mileage rental charge just the same as oil and gasoline, tires, and other like items are more or less straightline items as shown on Mr. Collins' chart No. 1.

In his dogmatic assertion that the maintenance component is a constantly-ascending straight line, Mr. Collins at least has the weight of a great deal of popular opinion back of his assertion, but as a great many fleet operators can testify, this is by no means the universal experience. In a great many cases the maintenance curve after an initial rise flattens out and remains at a fixed altitude during the greater part of the economic life of the chassis and does not again rise until it approaches the end of the truck's economic life.

It makes a great deal of difference what items of maintenance are included in Mr. Collins' maintenance component. If, together with the chassis mainte-

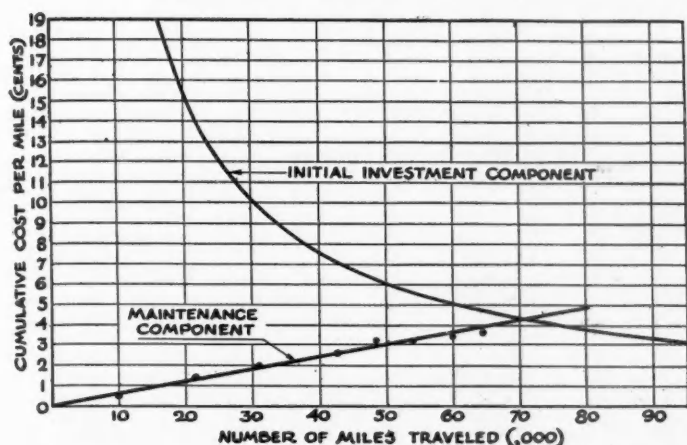
nance, maintenance of the body is also included, then the total component will be affected either favorably or unfavorably according to how well the body is constructed. A poorly constructed body, which involves high maintenance, would unfairly reflect upon the chassis, whereas a particularly good body would be unduly flattering to the chassis. The same thing applies to equipment of various sorts. Repainting, on the other hand, is an element of maintenance expense which has practically no relation whatever to the age of the chassis, and if this expense is incurred at infrequent intervals, it may result in an upward inclination of the total maintenance curve, which is most misleading.

Similarly the quantitative significance of the investment component is very seriously affected by its scope. Inasmuch as the size of the tire item in an expense account warrants carrying it as a pro-rated mileage charge, it is generally accepted as good practice to subtract the replacement cost of the tires from the investment for purposes of amortization.

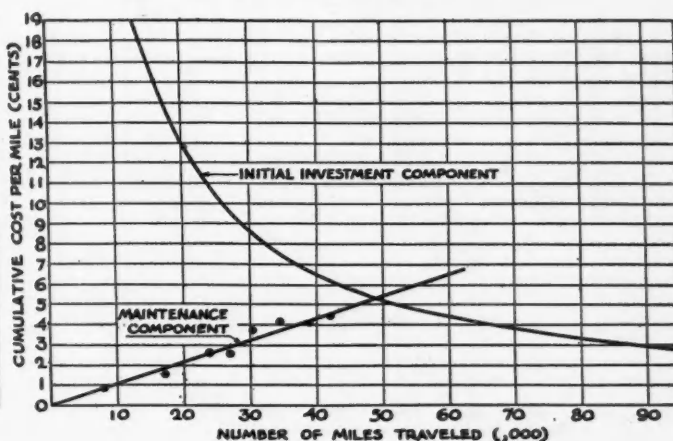
As Mr. Collins states, the trade-in value of the chassis is another subtraction from initial investment which should be made, and while it is true that the tendency for the net investment to approach the total investment becomes manifest as time goes on, it is also true that within a reasonable number of years the two curves can never meet, and therefore with a fixed maintenance component, the altitude of the investment component will make a difference in the location of the economic point.

Charts 3 and 4 represent two vehicles of different quality; that in chart 3 is presumably of higher price, but of longer economic life so that, while the investment component is higher at each mileage point than the chassis shown in chart 4, the economic point is reached later in its life owing to the lower main-

Collins Chart 3



Collins Chart 4



tenance component, which is the direct reflection of superior quality. These charts would be more graphic if a third line had been added above the other two indicating the sum of the two components. Such a curve would show that the sum of the two components in chart 3 is virtually level from 60,000 to 80,000 miles and that of chart 4 from 40,000 to 60,000 miles. Inasmuch as the trading value of a truck is governed more by its age in years and its condition than the number of miles which it has run, it would certainly seem that a careful operator would have nothing to lose and everything to gain by postponing the replacement period at least until the sum line began to rise. If I read Mr. Collins' philosophy correctly, the truck in chart 3 would be traded at 60,000 miles; that in chart 4 at 40,000 miles, whereas it would seem to be better business to trade that in chart 3 at 80,000 miles and that in chart 4 at 60,000 miles.

Comparing chart 3 and chart 4 it would certainly seem that a truck of still higher quality than that shown in chart 3 would have a still longer economic life and a still lower average cost per mile.

(The prominent fleet man who sent in the comments below asked that his name be withheld for company-policy reasons.)

I USED Mr. Collins' method back in 1925 and finally discarded it, particularly for the small cheaper vehicles inasmuch as it did not appear to bear out our actual experience. Since then vehicles have changed and with the present ratios between initial investment components and maintenance components for small cars his formula works out fairly well.

Applied to trucks, I believe it will prove an excellent aid to judgment and many other formulas now being used by fleet operators.



By A. F. COLEMAN  
Manager, Motor Vehicle Dept.  
Socony-Vacuum Corp.

I READ with much interest Mr. Collins' article in the May number of the COMMERCIAL CAR JOURNAL and while I agree in principle with Mr. Collins' method of retiring equipment, I do not subscribe in full to his views.

Mr. Collins assumes a case of a truck whose cumulative cost per mile at 40,000 miles is \$4000, or 10 cents per mile average. Assuming that this case is correct then the truck at the 40,000 mile point must be operating at a rate somewhat below the 10 cents a mile average, in order to compensate for the high cost per mile when the new truck is placed in service.

If the second 40,000 miles were to average 10 cents, then at some point between the 40,000 and the 80,000 mile assumed points, the cost per mile must mount above the 10 cents per mile average, to bring the average up to this amount.

From this it would appear to me that on this assumed case the economical point for retirement would move forward to some point between the 40,000 and the 80,000-mile mark where the mileage cost rose above the 10 cents per mile cost, which it must do to bring up the average.

It has been our experience that ob-

solescence of equipment has proven a very large contributing factor, governing trade-in time and a great deal of money has been saved in operations as the result of a survey. After this study of equipment and territory the installation of modern pneumatic-tired and high-speed trucks replaced a considerably larger number of old style units, reducing the number of trucks in service and increasing the radius of operation. In these changes performance of the new equipment was as much a factor as the operating expense of the old equipment.

A cumulative record of repairs and operating expenses is most essential to assist in determining when to discard the old truck. This, however, has not been the final answer in our operations, as many trucks that were properly assigned a few years ago were found to be entirely unsuited for present day operations due to changes in roads, traffic conditions and delivery methods.

Referring particularly to Chart No. 1 in Mr. Collins' article, the initial investment component crosses the maintenance component at approximately 53,000 miles and if I read Mr. Collins' conclusion correctly, this is the point at which he states the unit should be disposed of. Reference to this chart shows that the initial investment component continues to decline beyond the intersection point, showing that the truck had not yet been completely depreciated. It would appear to me, therefore, that some point beyond the intersection would be the trade in point, rather than immediately at the crossing, because the increased depreciation would tend to offset slightly increasing repair costs.

Our methods of calculating retirement time, however, are quite similar to the one outlined by Mr. Collins with slight modifications to fit it to our own particular needs.



# How Are Fleet Drivers To Be Treated After Having Accidents?

BY J. S. BAKER, ENGINEER, NATIONAL SAFETY COUNCIL

Survey of large operators shows three general systems are widely used to cut down accidents

**W**HAT to do with the driver who has had accidents, especially if he has had several, is one of the important problems of fleet safety. To determine present practice, an inquiry was sent to members of the Delivery, Taxicab and Bus Section of the National Safety Council and to motor vehicle departments of states having Drivers' License Laws.

There appear to be three general methods of handling the driver following one or more accidents:

(a) *Each Accident Considered Separately.* By this method, which is almost universally used in very small fleets, the management or a committee takes up each accident with the driver after it occurs, decides on the course of action to follow, and then closes the case without reference to other accidents except when somebody happens to recall previous accident experience of the driver being considered. As a rule, a decision is first made as to whether the accident is "chargeable" or not, that is, whether the

driver was at fault; and then a penalty is imposed. This method falls down in large groups of drivers where the individual driver's past record cannot be recalled.

(b) *Standard Procedure for Minor Accidents, Special Attention to Major Ones.* This method calls for a regular way of reporting accidents involving property damage of less than \$25 (for example), and bringing more serious accidents up for special review to determine whether they are chargeable or not. This method is used in fleets where the accidents are too numerous to give detailed attention to each one. It has the disadvantage that a driver with a number of minor accidents may escape notice, especially if he is able to make plausible excuses which classify them as non-chargeable.

(c) *Consideration of the Individual Driver rather than the Individual Accident.* This method calls for a different point of view from the others, and is used only in relatively few fleets. Extremely detailed records are kept on each individual driver, and his case is considered

as a whole every time he has an accident. Thus, one very serious accident may determine what should be done for or with him; but, more often, three or four non-chargeable accidents of a minor nature are the basis of disciplinary or educational action.

In the last, more highly developed method it is important to establish a point at which a driver's record will automatically bring him up for special consideration; that is, a definite rule must be established as to how many accidents of any kind, chargeable or otherwise, in a specified amount of driving would bring a driver up for special study and treatment. The following practices were reported:

- 7 companies give special attention for more than 1 chargeable accident per year.
- 6 companies give special attention for more than 2 chargeable accidents per year.
- 4 companies give special attention for more than 3 chargeable accidents per year.

The number of accidents per year permits only a very crude comparison, because of the extremely large differences in mileage per driver in different kinds of fleets, and even of different drivers within the same fleet. Thus, three accidents per year in one fleet might mean no more accidents per mile than one accident per year in another. Fleets in the Council on the whole average about 13,000 miles per vehicle per year so that, in general, we might roughly say that 7 companies give special attention for more than one accident per 13,000 miles and so on. Three fleets actually undertook to estimate the critical point in accident records in terms of mileage driven with the following results:

- (a) 1 accident per 10,000 miles.
- (b) 3 accidents per 35,000 miles.
- (c) 2 accidents per 50,000 miles.

Although it is impossible to average such diverse figures, one might conclude that it would not be out of line to call in for special consideration any driver who had had more than two chargeable accidents in a year or more than two of any kind in 50,000 miles of driving.

(TURN TO PAGE 40, PLEASE)





**R**EITERATED and widely circulated charges that commercial highway transportation is an outstanding example of those enterprises in which no serious effort has been made to regulate the hours of labor are refuted by analysis of a survey just made by the National Highway Users Conference. Thought has been given to the question of hours of labor.

The survey just completed shows that the hours of labor have been definitely fixed in 39 states; in approximately two-thirds by the state legislatures and in the remaining third by commission regulations. In 16 states the allowable period of continuous service is fixed at 10 hr., in 14 at 12, in three at 14, in four at 8, and in one at 7 and in another at 13.

Safety was the determining factor in bringing about a limitation of the hours of service. Unemployment is the factor now being considered by the National Recovery Administration. It is argued that if the hours of service already specified in a great majority of the states are further curtailed, it will naturally result in the further spread of work. If new schedules are fixed it may be assumed that the operators of commercial motor vehicles will cooperate as heartily as they did in those states where the principal motive was the maintenance of higher standards of efficiency resulting from the reduction of the hours of continuous service.

The survey of the National Highway Users Conference shows that North Carolina is the one state which has fixed 7 hrs. as the maximum period of service. Ohio, Oklahoma and Texas placed the maximum at 14 hours, Virginia at 13 hrs., and Alabama, Indiana, Utah and Idaho at 8 hrs.

The states in which 10 hrs. is fixed as the maximum are: Arizona, California, Colorado, Georgia, Illinois, Massachusetts, Michigan, Missouri, Montana, New Mexico, New York, North Dakota, Oregon, South Carolina, Washington and Wyoming.

Those states in which 12 hrs. was agreed upon as a maximum period of service are: Arkansas, Connecticut, Florida, Iowa, Kansas, Kentucky, Maine, Minnesota, Mississippi, Nebraska, Nevada, New Hampshire, Rhode Island and South Dakota.

## 39 States Limit Hours A Truck Driver May Stay at the Wheel

BY ROY BRITTON, NATIONAL HIGHWAY USERS CONFERENCE

Analysis of legislation proves much thought has been given to the question of hours and labor

Following is a summary of the state laws and commission regulations of the

hours of service of commercial motor vehicle operators:

State	Truck Carriers Covered	Limit on Consecutive Hours on Duty	Limitation Where Hours on Duty are Not Consecutive	Minimum Off Duty Hours	Law (L) or Commission Reg. (R)
ALA.	Com. & Cont.	8	8 in 12-hr. spread	8	L
ARIZ.	All	10	After 10 hr. in aggregate must go off duty	8	L
ARK.	All	12	After 12 hr. in aggregate must go off duty.	8	L
CALIF.	Contract	12	12 in 15-hr. spread	8	L
COLO.	All	10	10 in 24-hr. spread	8	R
CONN.	All	12	16 in aggregate in any 24 followed by 10 consecutive off duty	8	L
DEL.		No limitation			
D. of C.		No limitation			
FLA.	For-hire	12		8	L
GA.	Common	10		10	L
IDAHO	For-hire	8	10 in any 24	—	R
ILL.	All	10	10 in aggregate in any 16	8	L
IND.	For-hire	8	12 in aggregate in any 24	—	L

(TURN TO PAGE 20, PLEASE)

# STATE MOTOR VEHICLE SIZE

A star (★) indicates an official interpretation of restrictions by a qualified

STATE	MAX. NO. OF TRAILERS PERMITTED	LENGTH (ft.)	WIDTH (in.)	HEIGHT (ft.)	FOUR-WHEEL TRUCK GROSS (2 Axles)	SIX-WHEEL TRUCK GROSS (3 Axles)	TRACTOR & SEMI-TRAILER GROSS (3 Axles)	TRUCK & 4-WHL. TRAILER GROSS (4 Axles)	TRACTOR SEMI & 4-WHEEL TRAILER GROSS (5 Axles)	TRACTOR 4-WHEEL SEMI & 6-WHEEL TRAILER GROSS (7 Axles)	LOAD PER INCH TIRE WIDTH	AXLE LOAD	MINIMUM AXLE SPACE (in.) (V)	Must Trailers Have Brakes?	Must Trailers Have Clearance Lights?	What Reciprocity is Granted?
★ALA....	1/2	30u 40c	96	12	20,030	20,000	20,000	n.p.	n.p.	n.p.	n.r.	n.s.	n.s.	n.s.	yes	none
★ARIZ...	1 1/2	33u 85c	96	14 1/2	22,000	34,000	34,000	44,000	56,000	68,000	700 (flange)	18,000	n.s.	n.s.	(no info.)	(no info.)
★ARK....	1 (1)	35u 45c	96	12 1/2	700(L+40) (g) (2)	700(L+40) (g) (2)	700(L+40) (g) (2)	700(L+40) (g) (2)	700(L+40) (g) (2)	700(L+40) (g) (2)	(s) n.p. (p) (3)	(4)	96(f)	yes (5)	n.s.	for hire no; 4 per month by permit
★CAL.... (6)	1 1/2	33u 60c	96 100 (p)	13 1/2	22,000	34,000	34,000	44,000	56,000	68,000	600(s)(base) 500 (metal)	17,000	40(r)	no	yes	none
★COLO.	1 1/2	33u 60-85c	96	12 1/2	30,000	40,000	50,000	60,000	80,000	100,000	800 (flange)	20,000	40(r)	yes	yes	full
★CONN.	1 (7)	40	102	n.s.	26,000(s) 32,000(p)	26,000(s) 40,000(p)	26,000(s) 40,000(p)	26,000(s) 40,000(p)	n.p.	n.p.	800(s)(channel) n.r.(p)	n.r.	n.s.	yes	yes, if over 72 in. wide	equal (a)
★DEL....	1 1/2	33u 60c	96	12 1/2	22,000(s) (8)26,000(p)	22,000(s) (9)36,000(p)	38,000(s) 40,000(p)	(10)	n.s.	n.s.	700(s)(flange) 700(p)(casing)	16,000(s) 18,000(p)	n.s.	yes	yes	equal
★FLA.... Jan. 1934	1 Same	35u 45c Same	84(11) Same	12 Same	8,000(s) (12)16,000(p) Same	8,000(s) (12)16,000(p) Same	8,000(s) (12)16,000(p) (12)18,000(p) (17)	11,000(s) 24,000(p) 32,000(r) (18)	n.p. Same	n.p. Same	600(s)(contact) 600(p)(flange)(13) 550	16,000(14) Same	n.s. Same	yes Same	yes Same	(15) Same
★GA....	n.r.	30u 85c	96	12 1/2	22,000	39,600(16)	39,600(16)	44,000	61,600 (19)	83,000 (19)	800(flange)	17,600	n.s.	n.s.	yes	for hire no; others 4 trips per month
★IDAHO	1 1/2	35u 65c	96	14	600(L+40) (g) (20)	600(L+40) (g) (20)	600(L+40) (g) (20)	600(L+40) (g) (20)	600(L+40) (g) (20)	600(L+40) (g) (20)	800	16,000	120(f,21) 40(r)	yes(22)	no	none
★ILL....	n.r.	35u(x) 40c	96	n.r.	24,000	40,000	40,000	40,000	40,000	40,000	800	16,000	40(r)	yes	yes	equal
★IND....	1 1/2	33u 40c	96	12	19,200s (23) 24,000p (23)	19,200s (23) 24,000p (23)	19,200s (23) 24,000p (23)	19,200s (23) 24,000p (23)	19,200s (23) 24,000p (23)	19,200s (23) 24,000p (23)	640(s)(flange) 800(p)(flange)	12,800(s) 16,000(p)	40 in.	yes, Jan. 1, 1934	yes	(24)
★IOWA...	n.r.	30u 45c	96	12	450(L+53) (g)	Same	Same	Same	Same	Same	n.s.	14,000(s) 16,000(p)	40 in.	n.s.	yes	equal
★KAN.	1	35u 50c	96	12	24,000 28,000 on duals	34,000	46,500 Based on axle load	56,000 Based on axle load	n.p.	n.p.	n.s.	16,000 18,500 on duals	n.s.	yes	yes	10 consecu- tive days
★KY....	1 1/2	26 1/2u 30c	96	11 1/2	18,000(17)	18,000	18,000	n.p.	n.p.	n.p.	n.r.	n.r.	n.r.	n.s.	n.s.	n.s.
★LA....	1 1/2	33u 55c (25)	96	12 1/2	7,000 net load	10,000 net load	10,000 net load	10,000 net load	n.p. Jan. 1934	n.p. Jan. 1934	600	n.s.	n.s.	n.s.	yes	equal (a)
★ME....	1	36u (26)	96	12 1/2	20,000(s) 24,000(p)	36,000(p)	36,000(p)	36,000(p)	n.p.	n.p.	700(s)(flange) 600(p)(flange)	16,000(s) 18,000(p)	n.s.	n.s.	yes	all over 1 1/2 ton must reg.
★MD....	n.r.	n.r.	96	n.r.	25,000 (27)	40,000 (27)	40,000 (27)	50,000 (27)	65,000 (27)	80,000 (27)	650(s) n.r.(p)	n.s.	n.s.	no	no	equal
★MASS.	1	28u 40c	96	n.s.	28,000(s) 30,000(p)	40,000	40,000	(28)	n.p.	n.p.	800	n.s.	n.s.	n.s.	yes, if 3 tons and over	equal; but permit after 30 days no fee
★MICH..	2	40u 60c	96	14	(29)	(29)	(29)	(29)	(29)	(29)	700 (29)	18,000(29)	n.s.	n.s.	yes	10 days; not for hire
★MINN.. Jan. 1934	2 1 1/2	35u 63c 40u(x)	96 Same	12 1/2 Same	Based on axle load Same	Based on axle load Same	Based on axle load Same	Based on axle load Same(31)	Based on axle load Same(31)	Based on axle load Same(31)	n.s. Same	18,000(30) Same	n.s. Same	n.s. (32)	yes, if over 80 in. wide Same	equal (a) Same
★MISS..	n.s.	33u 50c	96	12 1/2	22,000	22,000	22,000	30,000	30,000	30,000	700	12,000	n.s.	yes	yes, if over 84 in. wide	no
★MO....	1	33u 40c	96	12 1/2	24,000 28,000(33)	38,000 42,000(33)	38,000	48,000	n.p.	n.p.	600(flange)	16,000 22,400(33)	n.s.	n.s.	yes	equal
★MONT.	1 1/2	33u 60c	96	14 1/2	24,000	34,000	40,000	48,000	58,000	68,000	800	13,000 and 16,800(34)	96(f)	no	no	for hire no; others 90 da.

## REFERENCE TABLE

1/2—semi-trailer.  
1—semi or full trailer.  
1 1/2—semi plus one full trailer.  
2—Two full trailers.  
a—with reservations.  
c—combination of units.  
f—distance between first two axles.  
g—Where weight is given by formula. L is distance in feet between front and last axles.  
n.p.—not permitted.  
n.r.—no restrictions.  
n.s.—not specified.  
p—pneumatic tires.  
r—distance between last two axles.  
s—solid tires.  
t—distance between tractor axle and semi-trailer axle.  
u—single unit.  
v—figure given is that necessary to get credit for full number of axles

used.  
x—tractor and semi-trailer considered single unit.  
1—Combinations in use exceeding specified limits may be operated until Dec. 31, 1934. Such combinations shall not exceed 3 units and 85 ft. length.  
2—If axle spacing is less than 7 ft. formula is 650 (L+40). Weight permitted by formula is, however, limited by axle load which in turn is limited by tire size. See (3) and (4). Solids not permitted on trucks or trailers.  
3—Gross weight based on table of tire sizes. Maximum load one high pressure tire 3000 lb., dual 5700 lb.; balloon single 4000 lb., dual 7600 lb.  
4—Axle loads based on tire sizes. Maximum allowed on one axle equipped with single high pressures

6000 lb., dual 11,400 lb.; on single balloon 8000 lb., duals 15,200 lb.  
5—Trailers now in use may be operated without brakes until Dec. 31, 1931, if coupled with safety chains in addition to standard coupler.  
6—Legislation in session at time of compilation.  
7—After Jan. 1, 1934, only semi-trailer permissible.  
8—36,000 with power brakes on rear axle.  
9—38,000 with power brakes on both axles.  
10—Full trailers limited to 10,000 lb. carrying capacity.  
11—Common and contract carriers allowed 96 in.  
12—20,000 lb. permitted common and contract carriers by Commission. Common carriers allowed 10 per cent overweight if Commission's brake, axle and tire requirements

are met. Payload in all classes of service limited to 12,000 lb. per unit. See (x).  
13—Common or contract carriers 550.  
14—In counties specified by Co. Comm.  
15—Reciprocity limited to vehicles bringing load of uncrated household goods and such from point of origin in license-issuing state. Return load may be taken only from destination point.  
16—Maximum payload 12,500 lb.  
17—Outside city limits 2-wheel semi-trailer allowed 1500 lb. gross on solids and 3000 lb. gross on pneumatics.  
18—Outside city limits 4-wheel trailer allowed 3000 lb. gross on solids and 16,000 lb. gross on pneumatics, latter applying to certificated carriers under Commission jurisdiction July 1, 1935.  
19—Interpretation not definite.

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# AND WEIGHT RESTRICTIONS

state official. A quad (■) indicates the interpretation is unofficial.

STATE	MAX. NO. OF TRAILERS PERMITTED	LENGTH (ft.)	WIDTH (in.)	HEIGHT (ft.)	FOUR-WHEEL TRUCK GROSS (2 Axles)	SIX-WHEEL TRUCK GROSS (3 Axles)	TRACTOR & SEMI-TRAILER GROSS (3 Axles)	TRUCK & 4-WHL. TRAILER GROSS (4 Axles)	TRACTOR SEMI & 4-WHEEL TRAILER GROSS (5 Axles)	TRACTOR 4-WHEEL SEMI & 6-WHEEL TRAILER GROSS (7 Axles)	LOAD PER INCH TIRE WIDTH	AXLE LOAD	MINIMUM AXLE SPACE (In.) (V)	Must Trailers Have Brakes?	Must Trailers Have Clearance Lights?	What Reciprocity is Granted?
★NEB...	1½	35u(x) 45c	96	12	32,000	32,000	32,000	48,000	48,000	48,000	n.s.	16,000	n.s.	n.s.	yes	equal
★NEV...	n.r.	n.r.	96	n.r.	25,000	38,000	38,000	50,000	63,000	76,000	600(base)	n.s.	42(r)	n.s.	yes	for hire no; others 5 days
★N. H...	n.r.	30u 45c	96	n.s.	20,000	20,000	20,000	40,000	40,000	40,000	750(base)	15,000	n.s.	n.s.	reflectors	(35)
★N. J...	1	28u 56c	96	12½	30,000 (38)	30,000 (36)	60,000 (36)	60,000 (36)	n.p.	n.p.	800(base)	2,900 to 21,500(36)	n.s.	n.s.	(37)	equal (a)
★N. M...	1	35u 45c	96	12½	600(L+40) (g)	Same	Same	Same	n.p.	n.p.	700(rubber) 500(metal)	18,000 bal. 16,000 (p)(s)	40(r)	(38)	yes, if over 80 in. wide	6 months
★N. Y...	1	33u 65c	96 106 (p) (39)	13	28,800(s) 36,000(p)	35,200(s) 44,000(p) (40)	30,000(p) plus (40)	30,000(p) plus (40)	n.p.	n.p.	640(s)(channel) 800(p)(contact)	17,920(s) 22,400(p)	46(r)	yes	no	equal
★N. C...	1	33u 55c	90	12	20,000	20,000	40,000	40,000	n.p.	n.p.	600(contact)	20,000	n.s.	yes	yes, if over 70 in. wide	equal
★N. D...	1	35u 50c	96	14½	32,000	32,000	32,000	32,000	n.p.	n.p.	600	16,000	n.r.	n.s.	yes	90 days
★OHIO (6)	n.r.	35u 85c	96	12½	20,000(s) 24,000(p)	20,000(s) 24,000(p)	36,000(s) 42,000(p)	40,000(s) 48,000(p)	56,000(s) 66,000(p)	56,000(s) 66,000(p)	650(contact)	16,000(s) 18,000(p)	n.s.	n.s.	no	equal
■OKLA.	1½	45u 45c	96	12½	24,000	24,000	31,000	48,000	55,000	55,000	600	n.s.	n.s.	yes	n.s.	none
★ORE...	n.r.	35u 50c	96	11 (41)	600(L+40) (g) (42)	Same	Same	Same	Same	Same	500 to 600	16,000(43) 17,000(44)	40(r)	no	yes, if over 72 in. wide	equal
★PENNA	1½	33u 70c	96	14½	26,000(45)	36,000	39,000	52,000	65,000	65,000	800(s)(channel) 800(p)(contact)	18,000	36(r) 96(t)	yes	yes, if over 35 ft. long	equal
★R. I...	2	85c	102	12½	28,000(s) 32,000(p)	40,000	40,000	56,000(s) 64,000(p)	68,000(s) 72,000(p)	80,000	800(flange) 500(metal)	22,400	n.s.	n.s.	no	equal
★S. C...	½	35u 35c	90	12½	20,000(46)	20,000(46)	20,000	n.p.	n.p.	n.p.	n.s.	10,000	n.s.	no	yes	(47)
★S. D...	1	28u 38c	96	11½	20,000	20,000	20,000 (48)	20,000	n.p.	n.p.	600(flange)	16,000	n.s.	n.s.	yes, if over 72 in. wide	90 days
■TENN.	1(49)	27u 35c	96	12	18,000	18,000	18,000	18,000	n.p.	n.p.	n.s.	n.s.	n.s.	yes	yes	none (50)
★TEX...	1	35u 45c	96	12½	(51)	(51)	(51)	(51)	n.p.	n.p.	600	n.s.	n.s.	no	yes, if over 70 in. wide	for hire 2 trips; others 5 per mo.
★UTAH...	1½	33u 85c	96	14	19,500(s) 26,000(p)	25,500(s) 34,000(p)	25,500(s) 34,000(p)	39,000(s) 52,000(p)	45,000(s) 60,000(p)	60,000	600(s)(flange) 800(p)(channel)	13,500(s) 18,000(p)	120(f) 40(r)	yes	yes, if over 80 in. wide	none
★VT...	1	50	96	12	20,000(52) 16,000(53)	20,000(52) 16,000(53)	20,000(52) 16,000(53)	20,000(52) 16,000(53)	n.p.	n.p.	600(contact)	n.s.	n.s.	n.s.	yes, if over 80 in. wide	equal up to 2 tons (54)
★VA...	1	33u 45c	96	12½	24,000	35,000	35,000	35,000	n.p.	n.p.	650(contact)	16,000	40(r)	yes	Yes (55)	equal
★WASH.	1	35u 85c	96	n.r.	24,000	34,000	42,500	48,000	n.p.	n.p.	800	12,000 to 18,500	120(f) 144(t) 42(r)	yes	yes	equal
★W. VA.	n.r.	35u 45c	96	12 12½	28,800(s) 36,000(p) (56)	43,200(s) 54,000(p) (56)	43,200(s) 54,000(p) (56)	57,600(s) 72,000(p) (56)	72,000(s) 90,000(p) (56)	100,800(s) 126,000(p) (56)	n.r.	22,000(57) 18,000(58) 16,000(59)	40(r)	yes	yes	none
★WIS...	1½	33u 60c	96	n.r.	24,000(60) 15,000(61)	36,000(60) 22,500(61)	43,000(60) 27,000(61)	48,000(60) 30,000(61)	67,000(60) 42,000(61)	96,000(62) 60,000(62)	800(mfg. rating)	19,000(60) 12,000(61)	n.s.	yes	yes	common carriers none
★WYO...	n.r.	40u 85c	96	12½	30,000	30,000	30,000	30,000	30,000	30,000	700(flange)	18,000	(40)	no	yes, if over 70 in. wide	common carriers none
★D. C...	n.r.	33u 85c	96	12½	28,000(s) 30,800(p)	36,000(s) 39,600(p)	36,000(s) 39,600(p)	56,000(s) 61,600(p)	64,000(s) 70,400(p)	72,000(s) 79,200(p)	800(s) 880(p)	22,400(s) 24,640(p)	44(r) 144(f)	n.s.	no	equal (a)

- 20—50,000 lb. maximum gross in any combination.  
 21—For 24,000 lb. and more.  
 22—If unladen weight over 1500 lb.  
 23—May be increased 600 lb. for each foot distance between first and last axles provided the 16,000 lb. axle limit be observed.  
 24—Equal except to foreign corp. doing business in Indiana and to trucks operating on regular schedule or between fixed termini.  
 25—45 ft. after Jan. 1, 1934.  
 26—Trailer limit 26 ft.  
 27—Gross weights limited by schedule of shipping weights.  
 28—All full trailers, excepting those of 1000 lb. or less carrying capacity and large platform trailers, barred after Jan. 1, 1936.  
 29—Permissible weights vary according to spacings, seasons and roads.  
 30—18,000 lb. with 8 ft. or more axle

- spacing; 12,000 if under 8 ft.; solids 80 per cent.  
 31—Full trailer over 2000 lb. net weight or 6000 lb. gross prohibited.  
 32—Yes on one axle where axle weight exceeds 7000 lb.  
 33—In cities of 75,000 pop. or more.  
 34—On 6 and 4-wheel vehicles respectively and 8 ft. or more spacing.  
 35—Trucks rated 3 tons or more must obtain permit limited to 5 days per yr.  
 36—Depends on tire size.  
 37—Light for every 10 ft. of length required on trailers carrying fuel tanks or automobiles.  
 38—Brakes on all wheels are required on new trailers acquired after Jan. 1, 1934, and on all trailers after Jan. 1, 1936, provided net load capacity exceeds 1500 lb.  
 39—106 (p) permitted only on vehicles registered before Jan. 1, 1933.

- 40—Gross weight limit for vehicle or combination having three or more axles on pneumatics, 30,000 lb. plus 750 lb. for each foot and major fraction thereof from center of front to center of rear axle.  
 41—Loads in excess of 11 ft., with 12½ the maximum, require permit.  
 42—Solids in municipalities only.  
 43—Paved highways.  
 44—Other highways.  
 45—Gross weights limited by schedule of chassis weights.  
 46—Truck over 4 tons mfr.'s rating must have special permit.  
 47—Not for hire 4 trips per month; for hire, 1 trip per month; Georgia licensed common carriers none. No limit on trucks hauling farm products from fields to market.  
 48—Tractor-semi-trailer comb. 30,000 if reg. prior to Apr. 1, 1933.  
 49—Maximum trailer gross 1 ton.

- 50—Except owner who hauls products grown on own ground.  
 51—Permits 7000 lb. net load; 14,000 lb. under certain conditions.  
 52—On state-aid roads.  
 53—In towns and inc. municipalities.  
 54—If load exceeds 2 tons \$20 is charged for each trip which can be applied toward registration fee.  
 55—If over 84 in. wide or high or extending 4 in. beyond truck.  
 56—All gross weights limited by bridge capacities and, for the present, are based on agricultural highway limits.  
 57—Solids and pneumatics on major highways in metropolitan areas.  
 58—Pneumatics on major agricultural highways; solids 80 per cent.  
 59—Pneumatics on secondary highways; solids 50 per cent.  
 60—Class A highways.  
 61—Class II highways.  
 62—Six-wheel tractor.

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## 39 States Limit the Hours a Truck Driver May Stay at the Wheel

(CONTINUED FROM PAGE 17)

State	Truck Carriers Covered	Limit on Consecutive Hours on Duty	Limitation Where Hours on Duty are Not Consecutive	Minimum Off Duty Hours	Law (L) or Commission Reg. (R)
IOWA	For-hire	12	12 in the aggregate in any 24 followed by 8 consecutive off	10	L
KAN.	All	12	14 when broken by regular rest period of not less than 2 hr.		R
KY.	Com. & Cont.	12	16 in aggregate in any 24 followed by 10 consecutive off	8	L
LA.	All	No limitation in effect but propose 14 hr. maximum consecutive service			
ME.	For-hire	12	16 in aggregate in any 24 followed by 10 consecutive off	8	L
MD.		No limitation			
MASS.		No limitation on trucks			
MICH.	All	10	10 in any 18—not over 14 in any 24	—	L
MINN.	For-hire	12		—	L
MISS.	All	12	16 aggregate of 24	—	L
MO.	All	10	10 and any part of 20 consecutive hours (At least 4 days off duty each month)	—	R
MONT.	All	10	10 in any 24	8	R
NEB.	All	12	16 in aggregate of 24 followed by 8 consecutive off	8	L
NEV.	For-hire	12	12 may be spread over 15 if runs permit relaxation	8	R
N. H.	All	12	After 12 hr. service 8 rest; after 16, 10 rest. (No rest period less than 3 hr. to break continuity of service)	8	L
N. J.		No limitation			
N. M.	For-hire	10	16 in aggregate of 24	8	L
N. Y.	All	10		8	L
N. C.	Franchised	7	14 in any 24	*	R
N. D.	Auto Transp. Cos.	10		8	R
OHIO	All	14	14 in aggregate in any 24	8	L
OKLA.	All	14		10	R
ORE.	All	10	After 12 hrs. in any 24 at least 10 consecutive off	10	R
PENNA.		No limitation			
R. I.	All	12	16 in aggregate in any 24 followed by 10 consecutive off	8	L
S. C.	All	10	10 in any 24	8	R
S. D.	Cert. or permit	12	12 in aggregate of any 24 followed by 8 consecutive off	12†	L
TENN.		No limitation on trucks			
TEX.	Cert. or permit	14	14 in aggregate of any 24 followed by 8 consecutive off	8	L
UTAH	Com. & Cont. Carriers	8	10 in any 24. Where schedule permits relaxation 10 may be spread over 15	—	R
VT.		No limitation			
VA.	All	13	13 in aggregate in 24	—	L
WASH.	Common	12	12 in aggregate of any 24 followed by 8 consecutive off	8	L
W. VA.		No limitation			
WIS.		Bill passed both houses. Not yet signed by Governor. Has 10-hr. limit			
WYO.	Cert. or permit	10	10 in any 24	8	R

\* 9 hr. at end of two 7-hr. periods with 1 hr. rest intervening.

† No period off duty shall be deemed to break the continuity of service unless it be for at least 3 consecutive hours.

## Recovery Is Up to All of Us

(CONTINUED FROM PAGE 9)

bill gives us the means to conquer unemployment.

The proposition is simply this:

If all employers will act together to shorten hours and raise wages we can put people back to work. No employer will suffer, because the relative level of competitive cost will advance by the same amount for all. But if any considerable group should lag or shirk, this great opportunity will pass us by and we will go into another desperate winter. This must not happen.

We have sent out to all employers an agreement which is the result of weeks of consultation.

The agreement has already brought a flood of approval from every State, and from so wide a cross-section of the common calling of industry that I know it is fair for all.

It is a plan—deliberate, reasonable and just—intended to put into effect at once the most important of the broad principles which are being established, industry by industry, through codes.

There are, of course, men, a few of them, who might thwart this great common purpose by seeking selfish advantage. There are adequate penalties in the law, but I am now asking the cooperation that comes from opinion and from conscience.

These are the only instruments we shall use in this great summer offensive against unemployment. But we shall use them to the limit to protect the willing from the laggard and to make the plan succeed.

You can look on every employer who adopts the plan as one who is doing his part, and those employers deserve well of everyone who works for a living. It will be clear to you, as it is to me, that while the shirking employer may undersell his competitor, the saving he thus makes is made at the expense of his country's welfare.

The essence of the plan is a universal limitation of hours of work per week for any individual by common consent, and a universal payment of wages above a minimum, also by common consent.

I cannot guarantee the success of this nation-wide plan, but the people of this country can guarantee its success.

That is why I am asking the employers of the nation to sign this common covenant with me—to sign it in the name of patriotism and humanity.

That is why I am asking the workers to go along with us in a spirit of understanding and of helpfulness.

# WISE WORDS FROM A SALES MANAGER'S NOTEBOOK

## Noted Nuggets for Salesmen to Hoard

- Selling trucks will never be a cinch. Competition will always be keen.
- Outstanding sales ability is the only thing today for which the demand greatly exceeds the supply.
- No salesman has a right to place his own price on the product he sells.
- Only the men who are not getting orders seem to be the authorities on what's wrong with business.
- There is no formula for selling, but there are factors which salesmen must adhere to or pay the penalty of lost business.

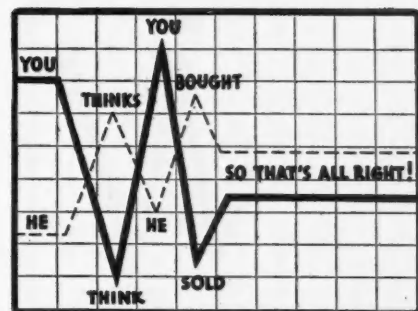
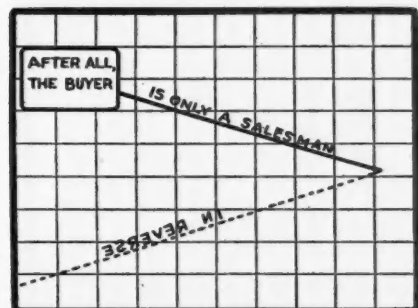
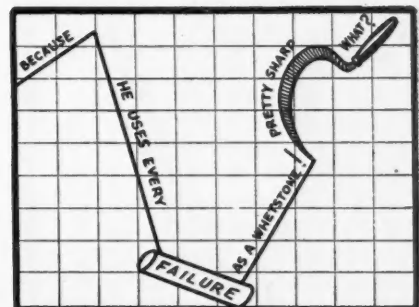
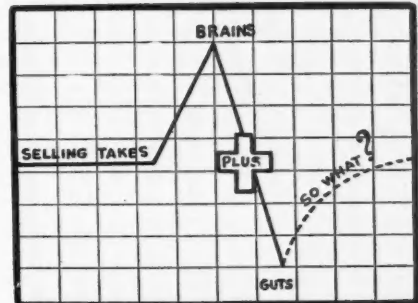
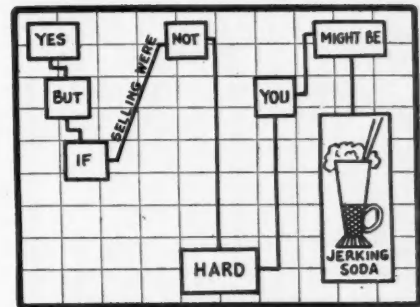
A FEW years ago the man who could make good things in large quantities cheaply was considered the most valuable. Today the most valuable man is the man who can sell things profitably.

There are very few things in this life more important than transportation and therefore for those who like selling, the possibilities are still unlimited in the truck business, particularly in the immediate future. A wonderful future lies directly ahead of the truck salesman. The largest order has not been placed yet, and replacement requirements are coming around in the regular cycle of depreciation by the thousands every year. Every one who has something to deliver is a prospect. Every truck sold today helps to sell another truck tomorrow.

There are very few truck salesmen today who could not double their commissions if they only determined to do it. The salesman earns just about what he makes up his mind to earn. If he wants money, comforts or power strong enough he will exert the necessary effort, and experience has proved that the relation between effort and results is astounding. There is no other field of endeavor that brings more or quicker compensation. But to be successful there is a certain course to pursue. Not that there is any formula for selling, but there are factors that we must adhere to or pay the penalty of lost business.

Constant study and self-improvement is highly important to make a real success in sales work, just as important as for the successful doctor to keep constantly posted on new methods of treatment or technique in surgery, the lawyer to keep his reference library up to date. It is essential to constantly keep informed upon every phase of truck transportation. Not only that, but to read general, business and current topics sufficiently to discuss them intelligently. The average salesman, I am sorry to say, does not consider self-improvement as seriously as he should, yet nothing stimulates courage and self-confidence as a real knowledge of his business. And nothing increases vocabulary or improves conversational ability more than reading.

There never was a truer statement than "knowledge is power"—and particularly in selling. No salesman can pass up the opportunity to improve his knowledge, ability and productivity, and no sales manager can expect the most sales from his poorest informed salesman. Even the seasoned veteran with a real sales record cannot afford for one minute to feel that he has "arrived," that there is nothing more to learn. If he does, he is on the journey backwards. The salesman of lesser intelligence and personality who keeps fighting and studying consistently is more valuable than the one-time star who works spasmodically or looks for easy prospects.



Selling Graphs by George P. Metzger,  
Courtesy Advertising & Selling

CANDIDLY this sales resistance we hear so much about is not entirely a question of the buyer's attitude, or price or specifications. I believe sales resistance can be classified as outward and inward; outward, that resistance

offered by the buyer and competition, and inward, the mental attitude of the salesman.

I have, and you have, known salesmen who, when they were feeling at top form, could sell more trucks accidentally than the average man could purposely, but when they were not feeling right they couldn't sell whiskey to an Indian! In plain words, salesmen work just about as they feel. If a salesman feels he is not being treated fairly, sore at his boss or permits the loss of an order to completely upset him, he cannot expect to be in the proper frame of mind to whip his competitor. Most salesmen are temperamental and I presume they must be to a certain extent, but the fellow permitting temperament to get too far out of control will soon develop a *sour* mental attitude that destroys enthusiasm which is so necessary to successful selling.

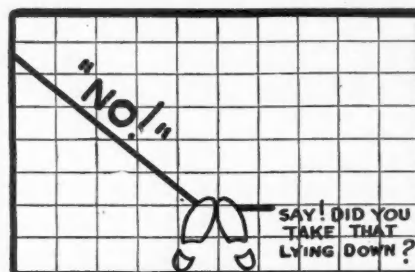
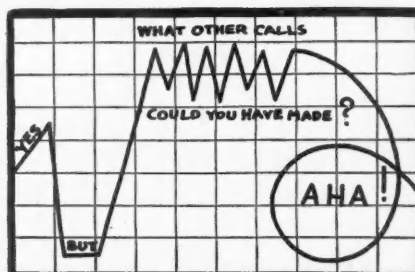
There is nothing more contagious than enthusiasm. The salesman who is genuinely enthusiastic over his product and his work wins the buyer's confidence, and in the final analysis selling is a matter of getting the buyer to think and believe as you really do. When he does, he is sold.

We must remember that we who have undertaken the work of selling have signed an iron-bound agreement with ourselves to fight for every order with courage and enthusiasm. Regardless of high pressure sales direction, or intimidating practices or consistent rebuffs we must maintain our courage, hold on to our sense of humor, and keep the old smile.

A salesman should never put too much dependence in the work he will do tomorrow. Today is the contest of thought and action, now is the time, and if he won't try hard to sell today he cannot expect to do much better tomorrow. Hard work is a good deal a matter of habit and when we once develop a faster pace it soon becomes real difficult to slow up. The man who has the capacity to work unceasingly need never worry about his future in sales work. I have seen many a truck salesman, who has been quite successful for five or six years, fall into a slump and immediately excuse himself by grumbling about the product he was selling or about the management and its policies. He saw the cause of his slump everywhere but within himself.

Now if a salesman blames the product he sells, the management or business conditions, he cannot take full credit when his sales record improves. He should look for the truth within himself; honest self analysis is a very valuable practice. Men in sales work should constantly ask themselves what they can do to improve their sales.

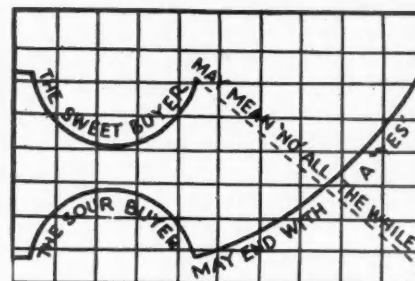
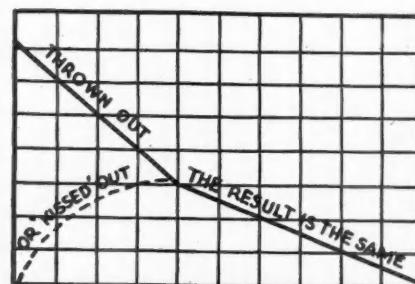
The most valuable factor in a sales-



man's life is time, and time is a very easy thing to become careless with. Few salesmen put in more than two and a half hours per day as an average actually talking to a prospective buyer in the truck business. Some of this time lost of course is beyond the salesman's control. When a salesman commences to treat the "law of averages" seriously he is on the road to success and it is at that point the number of interviews per day increases, the quality of the call improves and consequently the results are greater.

The only time that counts, yes, the only time that is worth a tinker's damn, is that time actually spent face to face with the buyer.

Making a careful study of the reason you lost a sale is highly important, in fact, just as important as knowing why you made one. And if you are not fairly certain of the real reason, ask the buyer frankly; put the question to him on a personal basis. If you have reason to believe he is truthful credit



it 25 per cent as the reason, and charge the other 75 per cent up as poor salesmanship. Partial reasons for losing truck sales are about as follows: price, terms, reciprocity, mechanical, past misunderstanding, and non-solicitation. Hence the salesman who fortifies himself against the possibility of losing for any of the above reasons is displaying real salesmanship, and he is incidentally clearing out his alibi.

Keep constantly in mind it's the salesman's job to sell. Only the men who are not getting orders seem to be the authorities on what's wrong with business. The men who are producing don't seem to have the time to discuss the matter. Salesmen seem to know so little about their own activities because they do not as a rule analyze their own efforts and results. The average salesman would without question increase earnings considerably without the slightest direction if he would keep mental, or better, written "histories" of his work, and particularly of the more potential accounts.

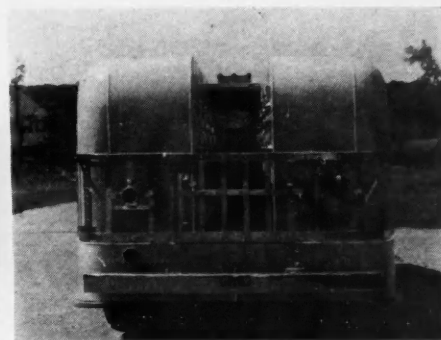
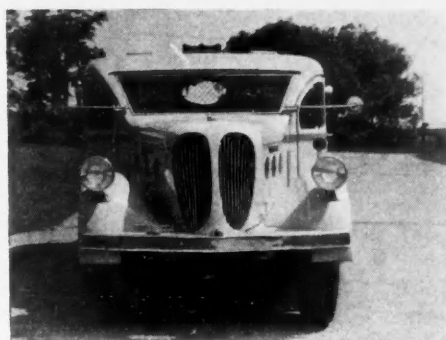
**P**PRICE is no doubt the outstanding major reason for lost sales, yet the same price prevails when sales are made. If price is the reason for a lost sale, then what is the real reason for an actual sale? People generally buy what they want, the price may be a little more than they feel they can afford or more than they want to pay but if they really want it strong enough they buy, and the unusually convenient terms offered often encourage their decision.

Prices are seldom too high if the real value is there, and it is the salesman's job naturally to prove this value. This should not be difficult for there is nothing made to sell today that offers more value for the dollar than a good motor truck. We who sell must keep constantly before us the two stages of the buyer's mind, namely, "What truck will I buy?" and "How cheap can I buy it?" We frequently don't know how close we are to an order, even at the very time the prospective buyer objects to your price most strongly. The first stage of the buyer's mind may be definitely decided but the second stage, "How cheap can I buy it?" is still uncertain. Then is the time to justify your price. The real salesman won't weaken at that point and give away his company's profit just to get an order. When he does, he weakens himself and it becomes more difficult, instead of easier, the very next time to face the same situation.

No one has a right to place his own price on the product he sells! It is not unnatural for a truck salesman to ar-

(TURN TO PAGE 32, PLEASE)





Here you have a front view, a side view and a rear view of the special ice cream delivery job which General Motors Truck Co. designed for use at the Chicago Century of Progress Exposition. The unusual design, notably in the arrangement of a double-row of mechanically refrigerated compartments, is an example of progress-plus in truck body design. Body hardware by Hansen.

## THE EAR-TO-THE-GROUND DEPARTMENT

### Coming Up—An 8 and 12

Look for Lycoming to announce new 8- and 12-cylinder engines soon. The eight is practically ready for the market, we understand, while the twelve is still in the thorough test stage.

### Diesels for Replacement

Cummins Engine Co. advises us that it is now ready to supply diesel engines for use as replacements. Replacement engines will be furnished truck manufacturers and dealers equipped to make installations. Engines will also be released to selected fleet operators of trucks and buses used in inter-city service only. The company wishes it made known that it has nothing to offer, at present, for "anything smaller than perhaps a 2-ton job." Engines of 448 and 677-cu. in. displacement are available.

### Hist! A Gay Lothario

A passenger car manufacturer with a splendid reputation is seriously flirting with the idea of producing commercial cars and light trucks. This is the first time this manufacturer has looked into truck possibilities. The investigation is still in what you might call a raw state.

### A Deal on the Griddle

Then there's the reputable truck manufacturer who is angling for another truck company to give him a complete range of prices and tonnages. Recently, we understand, there have been a number of favorable developments in the negotiations between the company of the first part, and the company of the second part. We hesitate to predict a deal. The company of the first part failed in a previous attempt to acquire still another company. The offer, we hear, was turned down not only flatly but rather cold.

### A Centrifugal Clutch

Harry Vail, designer of a centrifugal clutch now on the market, revealed to us that he has evolved a new model. While running, the clutch may be adjusted for speed at which it starts to pick up load, thus compensating for difference in engine idling speed. The new centrifugal action, he says, will provide pressure enough to handle truck engines. He deserted his Virginia chicken ranch long

enough to show friends in Philadelphia and New York what the clutch could do.

### A Diesel Approaches

The Waukesha truck Diesel announcement is awaiting certain refinement developments on the road, President H. L. Hornung writes. He assures us that readers of COMMERCIAL CAR JOURNAL will be among the first to get the announcement.

### Not a Drop in a Decade

A Buffalo factory branch recently staged a 10,000-mile run with a 1½-ton truck carrying a two-ton load. It was operated day and night over a hilly route at an average speed of better than 40 m.p.h. without a drop of water being added at any time. Credit for this remarkable cooling system result goes to the Illsley Co. which has a "closed radiation device" that is fitted to the radiator overflow outlet. Another test was made with a bus that required fillings every half hour. So far this bus has operated two months without requiring a drink. If you are interested we'll tip you off to the prices (very reasonable) and put you in direct touch with President Illsley (what could be more direct?)

### Now It's Black and Boo-hoo

Readers who wrote in declaring they were anxious to get their mitts on the volume of motor vehicle laws (in the black and blue binding) which the National Highway Users Conference was planning to publish will be sorry to learn that the publication date, if any, is a long way off. Meanwhile the legal staff is proceeding with the sweaty job of digesting all of the laws that have been passed by the so-called United States of America. However, if you are interested in the volume, don't let this notice prevent you from telling us. Enough interest may induce the NHUC (we dare you to pronounce that in one syllable!) to make the investment.

### Keep It Under the Hat

An expert guesser of our acquaintance says he shouldn't be surprised if a prominent truck company comes out in September with an engine-under-the-seat job. He bases his guess on the bid submitted

by the said company in an important fleet deal.

### That (Snap!) for Surprises

The above guess is interesting but frankly we wouldn't be surprised if half a dozen truck manufacturers came out with under-the-seat models. Such action would be entirely in keeping with legislative restrictions imposed upon the truck industry. (For conclusive proof study the tabulation on pages 18 and 19.) And we definitely expect quite a number of manufacturers to come out with models in which the engine extends out over the front axle. Some design of this sort is absolutely necessary in order to take full advantage of axle-load restrictions.

### An Actual Tractor-Truck

The new Allis-Chalmers four-speed farm tractor did 35.4 miles an hour on a one-mile dirt track in a five-mile test run supervised by the A.A.A. A new era of greater usefulness is foreseen for the tractor by the company, which believes that it can be extended to highway transportation and other useful work where speed is an asset.

### Watch for a Ford Finesse

Ford's loss of position in the truck field is causing some concern. Look for something to stimulate Ford truck business.

### Quoth the Rumor Bureau:

"The Ford Rumor Bureau hereby foretells a pointed inquiry from the manager of the department of prostrate ears by admitting that the 'lighter and lower-priced' job is not in production, and is not likely to be for some time. The bureau will, however, now take a bow for predicting that the new car, 'when, as and if,' will be a V-8. A recent Ford ad signed by the C.O. himself takes sides with the V-8 type of engine in no uncertain terms."

### Add Rumor Bureau Quote:

"What about the new Ford car? Ask President Roosevelt and General Johnson. The N.R.A. code activity makes price decisions uncertain for the time being in all lines. Ford will launch no new model during this time of uncertainty. The Rumor Bureau will remain on duty meanwhile."—G.T.H.

# TRICKS WITH THE WELDING TORCH

## THAT SAVE MONEY ON TRUCKS

By BILLIE BURGAN  
FLEET SUPERINTENDENT

I'M telling you the acetylene torch ranks first in our shop. I want to tell you something about torch operation, how to plan jobs, and some mighty profitable places to use the torch.

Follow through with me please, and I'll say you too can cut, weld, heat, bend, and fit iron to a lot of places that will assist toward that all desired goal of profitable, satisfactory operation.

The torch has many different uses which are not identified as welding. A lot of truck troubles can be out-generated with these uses, which I choose to call torch tricks. It is these tricks that make the torch a versatile instrument whose true merit is not generally realized.

A torch is lighted and a short piece of  $\frac{1}{2}$  in. x  $1\frac{1}{2}$  in. soft steel is being welded to another piece of the same material. The reason is this, we need four pieces, 5 ft. 2 in. long each, for steps, and material is 20 ft. long. It takes one hour or more to obtain more material from the metal supply house, but the 8 in. stub can be welded on in 10 minutes. We have the stub. Consider now, at least 45 minutes saved and the job proceeds. The need was material and the torch was the shortest possible cut.

In the time taken to tell about it the weld is completed, with no oxidation on it but a good smooth black iron fusion, indicating strength through

*THE author who has charge of the fleet of Hage's Ice Cream Co., San Diego, California, has devoted much time to developing time and money saving possibilities of the welding torch.*

*In this and succeeding articles he explains how the torch is used for other purposes in addition to welding, such as loosening parts, bending and cutting and forming rods and bar stock for braces and similar parts. The second article will appear in an early issue.*

the weld. Pressures at the regulators during this weld were 8 lb. on oxygen, 8 lb. on acetylene and a No. 8 tip in the blow-pipe.

One yester-year welder says, "Impossible to get any place in a weld so heavy without 15 lb. pressure." The why? In improved torch, operating on lower pressure, thus permitting better amalgamation in the flow puddle, is the answer.

Speaking of pressure, successful torch operation hinges on it, and though you might set a good operating flame with no thought of regulator, it stands you in hand to shoot trouble when pressure goes awry.

Suppose that in the middle of the weld mentioned, our torch tone quieted slightly and a few seconds later popped out. Then we re-lit it and proceeded to the finish just as it popped out again. The answer to those failures is faulty pressure of oxygen or acetylene or both.

The way I trace pressure is to shut off both tanks and exhaust the lines by opening and closing torch valves with regulators in the last operating position. Then I open acetylene tank valve, meanwhile watching the gages. If the supply gage hand precedes the tank gage hand, the screen is clogged at the tank—disconnect and clean it. If the tank gage hand precedes the supply gage hand to the operating position, all is okay up to the regulator. Now I open the torch valve and if the gage hand fluctuates more than 5 lb. and fails to steady itself I know the regulator is faulty. A spring, a diaphragm, or a center seat may correct it. If regulator indicates a steady pressure flow, the restriction is in the line or at the torch. In this case disconnect line at the torch, open regulator and observe the flow. If open and free the trouble is in the torch—clean it—if not, the line is clogged or faulty, possibly a leak. Trace oxygen in like manner beginning at the tank.

With supply and pressure established adhere to the known required pressures for the torch for the strongest welds possible by any tip.

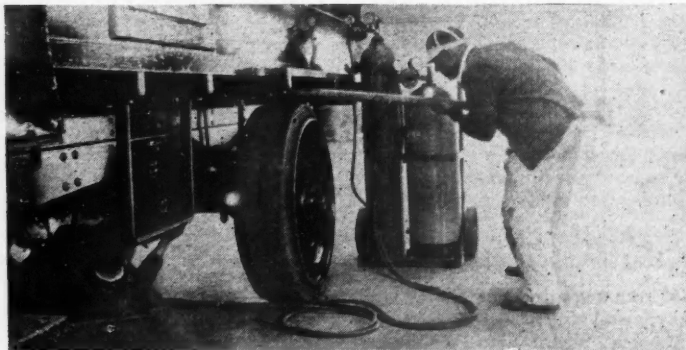


Fig. 1—A rear spring stud is loosened by heat from torch

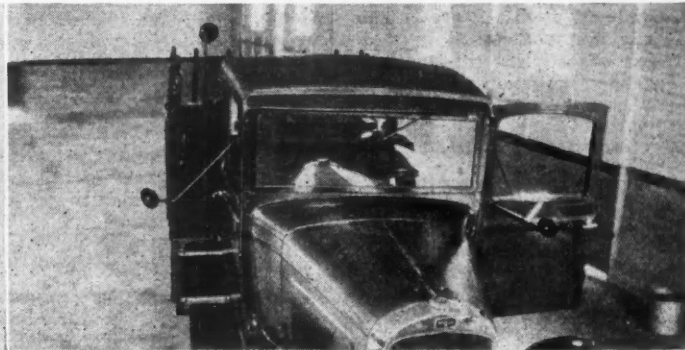


Fig. 2—Rear view mirror brackets were made by the welder





To set the flame for action, start with acetylene, and open until flame will just adhere to the pipe tip, then open the oxygen enough to neutralize the central tongue. A little more acetylene may be added; elongating the central tongue an inch or so, then enough more oxygen to neutralize it.

For filling holes and welds not subject to stress, the latter setting is faster and will serve nicely where strength is not the chief demand. It is also faster for a quick heat on a stretch

bend. For frame welding and similar jobs rely on the first setting for the most satisfactory results.

The cutting flame setting is similar to the welding flame, except a neutral condition of pressure must be retained while operating the cutting lever. It is good practice to trigger the cutting lever and observe the flame condition before starting a cut.

Let us roll to another job and learn more about fire by using it. A tired hand and a hammer and punch have failed to dislodge a spring bolt and pin. The torch-mind reasons that the metal surrounding the tie bolt will expand under heat and release it. The flame is applied, the tie bolt responds to a few light hammer blows, and the spring pin follows it easily. Five minutes of the Mobile Fire Fly relaxed that congestion.

The job shown in Fig. 1 contacted our ability in the evening with a left rear spring trying to part company with the truck. Broken washers on the top spring plate released the leaves allowing them to work. The clamp studs were rusted fast in the housing presenting a problem.

After removing the nuts a jack was raised under one stud at a time, causing the truck's weight to rest on it while the top was twisted. A penetrating oil was sprayed generously to aid the loosening. By this method three studs came out. The fourth, between spring and brake drum in the forward side of the axle housing, refused.

A kerosene soaked rag was wedged in around it for the night. Next day, after numerous attempts failed to dislodge it we trained the torch on the housing with a No. 10 tip pushed up to the pressure limits. After about 15 minutes of this treatment, with a man pulling back and forth as shown in the picture, that stud was brought out with a squeal. It was still rust dry for at least 2 in. None of the liquids had entered around that stud. This is con-

vincing proof that if they don't move get the torch after them and those spring clamp studs must come out. This job was on a Mack AB.

We believe in good safety measures and not the least of these is to carry two rear view mirrors on all route trucks.

The photograph (Fig. 2) below shows the rear view mirror on both doors, which for driver vision excels all the mountings tried thus far. It is out of the way when the door is open, and of neat appearance.

The main support is  $\frac{1}{4}$  x 1 in. soft steel; the brace is of  $\frac{5}{16}$  in. rod, and the mirror arm is a  $\frac{1}{2}$  in. rod welded to a slug of  $\frac{1}{2}$  in. flat. The mirror rod passes through a hole in the main support and is clamped when the nut is tightened at the foot of the brace. Ends of the brace are threaded, heated and bent and then washers are brazed to it, making flanges. Upper end of brace passes through the door. A hole in the arm rod provides the fastening ground for the mirror stud. Main support is fastened to the door with one flat head stove bolt and two wood screws.

The driver of the truck in Fig. 3 told us one of the headlights vibrated badly, impairing his vision. He suggested adjustment.

Examination revealed small cracks in the cross support, near the fender. We removed the headlamp, welded the cracks and then added some lengthwise ribs of metal to stiffen the bar. We put tin around the bar to protect the paint during welding.

The change was like magic. The driver reported a good steady light. It cost us less than a dollar to fix the lights with the Fire Fly.

No trick in the lot of ideas is worth more than the one shown in Fig. 4. Torch cuttings will ruin a good floor, cut shoes off your feet, start a fire and burn you, too. All of this can be prevented by making cuts over a bucket of water.



Fig. 3—Shaking lamps were quieted by stiffening support

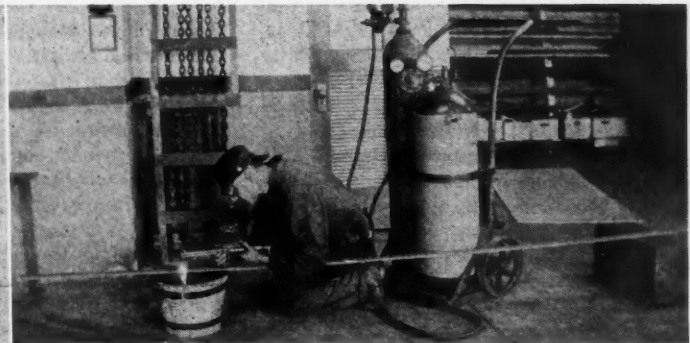


Fig. 4—Do cutting over pail of water—spare the floor



# AFTER HOURS

EDITORIAL COMMENTS BY GEORGE T. HOOK, EDITOR

## The Code Low-Down

**I**F the National Industrial Recovery Administration is disappointed in operators of motor trucks for not having submitted their blue eagle code long before this, it has only itself to blame. The responsibility must be attributed to a change of opinion on the part of the administration.

This change of opinion, it is our personal belief, was not unfortunate in itself but it certainly led to some very unfortunate developments.

It was the administration's original opinion that a code would be required to cover only for-hire operators. Consequently when representatives of truck associations assembled in Chicago back in July they agreed that the American Highway Freight Association, an existing body composed of a small group of for-hire haulers, should be the nucleus of a national organization representative of all for-hire operators and, as such, to be the responsible association for the framing of a for-hire truck code.

The agreement was, admittedly, a compromise, and the truckmen scattered to their homes, believing that at least they had started the ball rolling in the right direction. But they had no sooner tucked their napkins once more behind their collars than a merry tempest broke loose.

## A Hope Expressed

**D**EPUTY ADMINISTRATOR MUIR on July 24 expressed the hope that any code submitted to the N.R.A. should cover all types of highway freight transportation—common and contract carriers and “the much larger numerical volume of privately owned trucks.” This hope was based on the fear that if a common code were not adopted the N.R.A. saw “possibilities of a situation arising where part of the highway freight transportation industry would be governed under a code which because of competitive conditions might be absolutely destructive to them.”

There was nothing basically unsound about this reasoning and in fact it showed a commendable concern for the for-hire operators. If Mr. Muir's letter had said nothing more it is likely that the nationalized American Highway Freight Association could have handled successfully the mechanics of getting together a group representative of all types of carriers and proceed to fulfill Mr. Muir's hopes.

Unhappily the letter contained this comment: “We are not, of course, in a position to dictate who shall submit codes and wish to avoid any inference to that effect, but we are very hopeful that the state truck associations, which I am given to understand represent all types of users of motor trucks, will, in the near future, appoint some member from each state who will truly represent the entire motor

truck field and who collectively will formulate a general motor truck code.”

## And What Happened

**T**HE American Highway Freight officials, apparently unable to avoid the inference that here was an attempt to discredit the association's standing, were whipped into a fury. They called a board meeting in Washington for July 26. And from then on strategy went slightly haywire.

We shall not undertake to recite the details of developments which, heaped one on top of the other, simply smothered Mr. Muir's hopes for early submission of a truck code. But it should be said, briefly, that the guiding forces of the American Highway Freight Association became involved in dealings with the Brotherhood of Railroad Trainmen and in an attempt to discredit Deputy Administrator Muir with the President of the United States.

Mr. Cotterill, general counsel of the American Highway Freight, publicly denied any bargaining with the railroad brotherhood and declared the association had played no part in the Roosevelt incident, but the railroad brush had done its tarring and the association became the victim of intense suspicion.

Suspicion was already deeply rooted and widespread when Mr. Muir expressed his fateful hope. Immediately that his hope became known efforts were begun to realize it through the formation of an organization that would be truly representative of all types of haulers. Here again the American Highway Freight officials made the mistake of openly opposing the formation of such an organization. Their chief weapon in this attempt was the oft-repeated statement that truck manufacturers were back of the plans for the new organization and that their purpose was to foist their own ideas of a code on operators.

## Unselfish Motives

**W**E shall not pretend to be ignorant of the fact that manufacturers did support the movement for a federation embracing all types of motor transport. But we shall pretend to know that their motives were not selfish. Their purpose was to serve the best interests of all forms of truck use. If it had been otherwise they would have encouraged the for-hire operators to codify themselves into a shackled existence that would make it profitable for their shipper customers to own and operate their own trucks. Thus an immense market would have been opened to the manufacturers. Because it remains a fact, emphasized by Col. Sherrill, of Kroger Grocery, at Washing-

ton, that if the common carrier is so regulated and restricted that it becomes cheaper to deal with the contract carrier, the business will go to the contract carrier. And if the common carrier and the contract carrier are so restricted and regulated that it becomes cheaper for the shipper to own his own trucks, the shipper will proceed to establish private transport facilities.

Consequently, in fostering a national transport federation representative of all types of truck owners the truck manufacturers do not deserve the accusations leveled at them.

## We Must Federate

**I**T is our personal opinion that a transport federation such as proposed is not only advisable but imperative. The pity is that it was not an accomplished fact at least five years ago. It is necessary not only to deal with the present emergency but to afford the operators of motor trucks a voice that will speak impressively on all present and future occasions involving their interests.

There is a need and place for such a federation just as there is doubtless a place for a national organization that will be truly representative of the for-hire operators, such as the present American Highway Freight Association. The for-hire operators should speak with a united voice on all matters affecting their interests. And we can see no reason why the American Highway Freight Association, while jealously guarding the interests of its own members, should not belong to the transport federation and actively participate in those many matters affecting every truck operator regardless of type.

There is no basis for anyone's presuming that the effort to organize a national federation should resolve into a knock-down-and-drag-out fight between the American Highway Freight Association and the groups sponsoring the federation. Fundamentally there is no basis for a dispute. It is not intended that the federation should replace the American Highway Freight Association, and the latter, being strictly a for-hire organization, cannot justify any attempt to obstruct the formation of a body that would be all-inclusive.

Nothing must stand in the way of uniting as quickly as possible all truck associations into a national organization. This body must be truly representative of all trucking interests. It must be born without a blemish on its name if it is to make a successful bid for public confidence and support.

It must be born now—or never. And by never we mean that if there are not now enough common grounds for its formation, there never will be.—G. T. H.



# How About a Vehicle Registration Code Based on Tire Capacities?

BY PIERRE SCHON

*Transportation Engineer*

GENERAL MOTORS TRUCK CO.

IN the legislative sessions held this year in 43 States, there has been very little evidence of attempts to achieve closer uniformity in the methods of registrations of commercial motor vehicles. The need for greater uniformity becomes more apparent each year as new rulings and legislative enactments tend to place additional complications on the procurement of motor vehicle licenses. At the present time there are no less than four major systems in effect for the registration of motor vehicles.

## • Payload Capacity Rating

It will be noted that the states using payload capacity as a basis for registrations are in preponderance. During the early years when most commercial vehicles were equipped with solid tires, trucks as a rule were built with a far greater carrying capacity than the manufacturer's payload rating. There was a mutual understanding between the manufacturer and the operator that a truck rated at 2 tons was capable of carrying 4 tons, or a 100 per cent overload. These slow-moving vehicles were built heavy and rugged to withstand the shock and vibration caused by the solid tires. Heavy chassis weight was considered a very advantageous feature.

However, important changes have

Who criticizes the different systems now in use and argues the value of using the standardized load capacity ratings of tire makers

## REGISTRATION AND TAXATION OF COMMERCIAL VEHICLES

Existing Methods	No. of States
1. Payload capacity rating.....	30
2. Net chassis weight— with or without cab but exclusive of body.....	7
3. Net vehicle weight— including cab and body.....	5
4. Gross vehicle weight— including cab, body and payload .....	13

been made in truck design during the past few years, especially since the advent of the pneumatic tire and the more recent adaptation of the soft, low-pressure balloon tire.

While it was common practice to

overload solid tires without materially increasing the tire expense, operators have learned that it does not pay to overload a balloon tire beyond the tire manufacturer's load-carrying capacity rating.

Chassis vibration has been considerably reduced by the use of low-pressure balloon tires and this has enabled truck manufacturers to build lighter chassis with more pounds of payload capacity per pound of dead chassis weight.

Great improvements have also been made in the metallurgical arts with higher grade steels and other materials permitting considerable reduction in the chassis weight without impairing the carrying ability of the vehicle. Developments in the use of aluminum frames are progressing, still further reducing the chassis weight.

Payload capacity ratings cannot be definitely established because there is a tremendous difference in the weight of bodies. For instance, a 3-ton truck may be equipped with a light stake body weighing only 1200 lbs., while another operator will place a heavy moving van body weighing 4500 lb. on this same type unit, making a difference of 3300 lb. in the actual available payload capacity.

Then again in some states, it is de-

sirable to register vehicles with the maximum payload capacity, while in other states the owners demand the lowest payload rating in order to effect a saving on the license tax. This has made it necessary for manufacturers to adopt a RANGE of payload capacity. For instance, many of the lighter trucks are listed now as having a 1½ to 2-ton capacity, while the next sizes are registered as having a payload capacity ranging from 2 to 3 tons, or from 3½ to 5 tons.

Several years ago the truck manufacturers attempted to change from the payload rating to the so-called straight rating, or maximum gross weight of the chassis including body and payload. In the *Commercial Car Journal* there is evidence that most of the manufacturers have adopted the gross weight rating and as a rule the manufacturer's gross weight rating does not exceed the total load capacity of the tire equipment. The entire truck manufacturing industry would prefer to use the gross weight rating only; yet, due to many of the states still licensing vehicles by payload capacity, the manufacturers are compelled to retain a payload capacity rating.

#### • Net Chassis Weight

We have seven states where commercial vehicles are registered by net chassis weight. In some the manufacturer's net shipping weight is taken as a basis, while in others the chassis may be modified and licensed according to the weight of the chassis prior to mounting the body.

Then again, in other states, the cab may be added to the chassis weight.

#### • Net Vehicle Weight

In this group we have five states and experience in Michigan proves that this is not the correct method of registering commercial vehicles. The Michigan law requires that a weight ticket be submitted with the license application. The license tax is computed according to the weight of the vehicle as reported on the scale ticket. Considerable evasion of this law has been practiced in this state by false and fictitious weight tickets.

To make the situation even more complicated, we find that in a number of states, private operators and commercial carriers must register their vehicles by different systems. For instance, in Florida, the "for hire" truck is registered by gross weight, while the private operator can register his truck by net chassis weight.

#### • Gross Vehicle Weight

Eleven of our states have adopted the method of registering vehicles by

gross weight which means the weight of the chassis, cab, body equipment and payload. In most cases the gross weight on which the license is paid is the gross weight rating established by the manufacturer. There is no question that this method of registration is by far the most practical and also much more simple in its application and enforcement. However, there are possibilities of evasion and misrepresentation under this method.

#### • Standard Uniform Code

In view of the inconsistencies as outlined above, this would seem to be a most opportune time to give consideration to establishing a standard uniform code for licensing motor vehicles. A close study of this problem inevitably points to using the gross weight of a vehicle as the basis for registration and collection of the license tax. This method is also suitable for passenger cars, both the private automobile and motor bus.

The question arises, however, how to establish a practical, workable basis for such a code on a fair and equitable basis and in a simple form in order to avoid unnecessary complications and burdensome and expensive checking on the part of registration bureaus and the enforcement officers.

I do not believe that the manufacturer's gross rating should be used as a basis for the simple reason that it is customary practice now with all manufacturers to establish different gross weight ratings on the same chassis, depending on operating conditions, tire equipment and additions of special equipment, such as attachment axles, etc.

However, there is one simple way of definitely determining the gross weight capacity of any vehicle, namely, the tire manufacturer's load capacity rating. These ratings have been fairly well standardized by the tire manufacturers. Truck manufacturers' gross weight ratings of chassis are controlled

to a large extent by the load capacity of the tire equipment.

For example (see below), let us take

#### OPTIONAL TIRE EQUIPMENT FOR MEDIUM-DUTY TRUCK CHASSIS

Single Tires		Dual Tires
Front		Rear
Balloon Tire Size	Load Capacity Per Tire	Load Capacity Six Tires
7.50/20	2100	12600
7.50/24	2400	14400
8.25/20	2550	15300
8.25/22	2800	16800
8.25/24	2950	17700
9.00/20	3250	19500

a medium-sized truck with an approximate chassis shipping weight of 5000 lb., equipped with single tire front and dual rear tires. All truck manufacturers give the buyer a choice of optional tire equipment and on this type of vehicle, the optional tire equipment ranges from 7.50/20 heavy service balloon to 9.00/20. The difference in the load capacity for the six different tire sizes optional for this vehicle varies from 12,600 lb. to 19,500 lb. The maximum gross weight rating established by the manufacturer on this chassis, however, may be only 16,000 lb.

In other words, this chassis may be used with a gross of 12,000 to 14,000 lb. for extremely severe operating conditions in mountain territories, while on level concrete pavements under ideal operating conditions the same chassis with auxiliary rear helper springs may be safely loaded up to 19,500 lb. gross according to the maximum tire equipment recommended by the manufacturer. It is obvious, therefore, that it is impossible for the manufacturer to definitely establish a maximum gross weight rating on a chassis, except as based on the load capacity of the tire equipment.

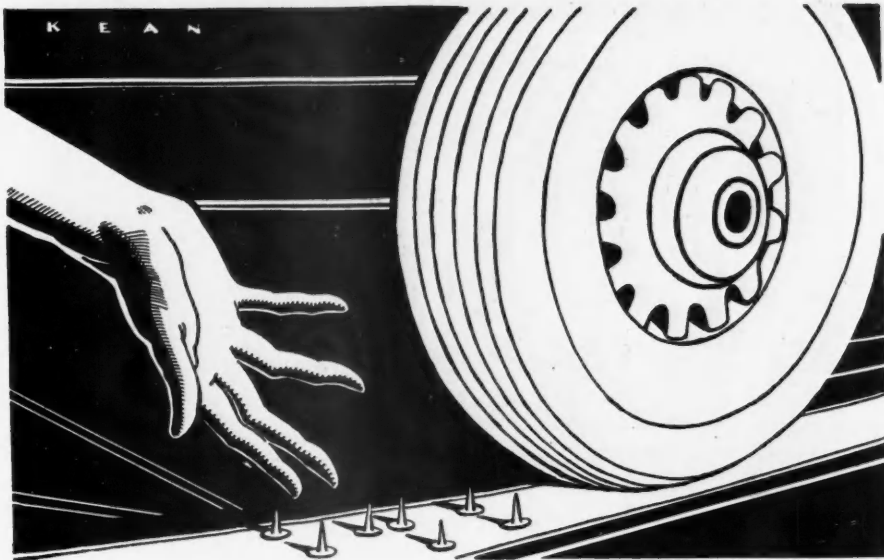
It seems reasonable to assume that the most simple procedure for determining the maximum gross weight of a vehicle, is to use the total tire load

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#### Suggested Vehicle Gross Weight and Tire Load Capacity Certificate

This is to certify that I have inspected on (Date and Year) a (Trade name of vehicle; Type of vehicle; Style of body; Manufacturer's serial number) and found that this vehicle equipped with (Number) tires, the type, size and load capacity of which are listed by the tire manufacturer as described hereafter: (Tabulation showing Tire Location, Number of tires, Tire make, Tire type and Tire manufacturer's rating, load capacity in pounds per tire and total for front wheels and rear wheels; and Total tire load capacity of all tires in pounds.) Signature, Tire company, Address, City, State. I herewith certify that I am the owner of the vehicle described above and that this vehicle is equipped with tires as described by Mr. (Name of Inspector) in this certificate. (Owner's name, Occupation, Address, City, State.)





## Take These Tips from an Expert and Deflate Fleet Tire Costs

By J. W. SHIELDS  
*Field Engineer*

FIRESTONE TIRE & RUBBER CO.

### *Inside Dope on Duals*

**T**IRES must receive a good deal of real attention if they are to deliver all of the miles that are built into them. The time and labor spent in examining, inflating, changing and repairing is repaid many times by the extra miles delivered by the tires. For best results it is essential that one man in a fleet organization be held responsible for all service of tires. Too many operators leave this work to the drivers or mechanics or whoever may at the time be available. Such hit and miss service can only result in increased tire cost and unnecessary road delays.

The number of trucks which one man can properly service will, of course, vary according to the tire equipment and the mileage run. Under average conditions one man can handle complete tire service including all repairs on about 20 to 25 trucks. If repairs are not included, one man can handle the other work on about 40 to 50 trucks.

The tire service man should be responsible for the following work:

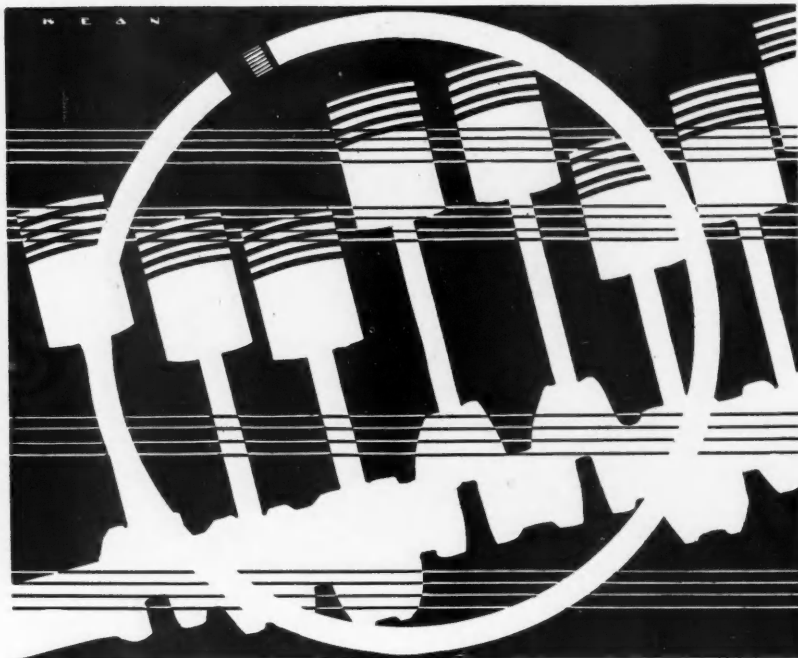
1. Checking air pressure and inflating tires,
2. Mounting and demounting tires,
3. Seeing that trucks are equipped with proper spares,
4. Daily inspection of all tires in service,

5. Removal of tires that are worn out or in need of repair,
6. Changing position of tires to secure better mileage,
7. Checking wheel alignment,
8. Reporting to superintendent on abused tires,
9. Reporting changes, failures and repairs to office.

Inflating tires is listed as the first duty of the service man because it is the most important and also the part of the work which is most liable to be slighted. The pressure in every tire in service should be checked every day and a record should be kept of the pressure found in each tire. The use of such a record will enable the service man to readily locate tires that are losing pressure. When the pressure in a tire is found to be low on two successive tests, it should be taken as a warning signal and the tire removed and the leak corrected. It is preferable in most operations to make the daily inspection of tires at night when this work will not interfere with regular operations.

Valve caps are an insignificant item and, therefore, often overlooked. Yet valve caps are a very essential and extremely important part of the equipment. It is just as important to keep

(TURN TO PAGE 38, PLEASE)



By  
**J. W. Cottrell**

**Technical  
Editor  
Commercial  
Car Journal**

## Ring Design Has Met Challenge of Modern Operating Problems

**T**HE name of the first mechanic who grabbed an "egg-beater" drill and bored holes in the lower inner edge of a ring groove in a desperate attempt to cure oil-pumping is not recorded in the bright history of things automotive. He deserves acclaim as the forerunner of a host of able gentlemen who have conquered the problems of piston ring design as they arose from time to time. It should be "all the time" in the opinion of one engineer.

None of the credit due maintenance men and designing engineers is taken away by recalling that much of the advance in piston ring design was attained by searching out the problems involved. No one, these days, gives a

**Separate types of rings hold compression and control oil in old or new engines despite increased speed, load and oil thrown off of bearings.**

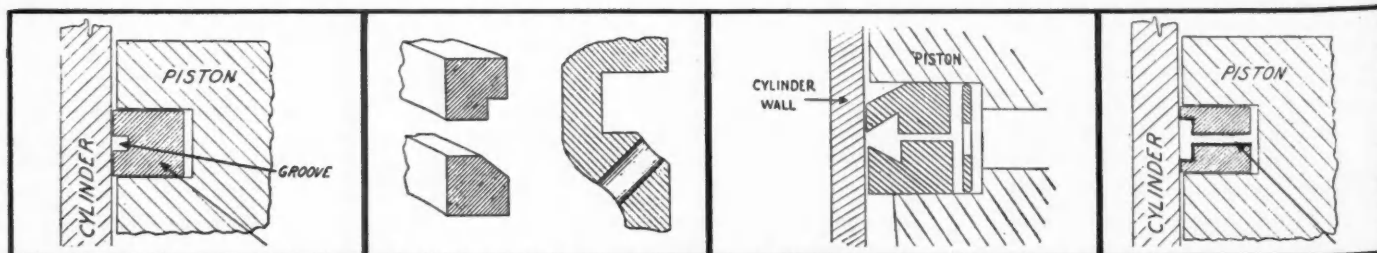
thought to the fact that piston rings are divided into compression rings and oil control rings. But not so many years ago rings were rings each of which was expected to perform all the functions now bestowed upon plain and special rings of many types.

Another classification now taken as a

matter of course denotes a better understanding of conditions. This is the distinction between the needs of a new engine and those of a worn engine. Rings cannot cure troubles which result from cylinders and pistons worn so badly that a hack saw blade can be pushed down by the piston. But rings have been designed to meet the needs of engines which are no longer perfect but are not worn out. These rings are fashioned to hold compression and control oil in cylinders with a moderate amount of taper and out-of-roundness.

Just a few years ago, oil pumping was the major reason for keen interest in piston rings. And the oil pumping

(TURN TO PAGE 34, PLEASE)



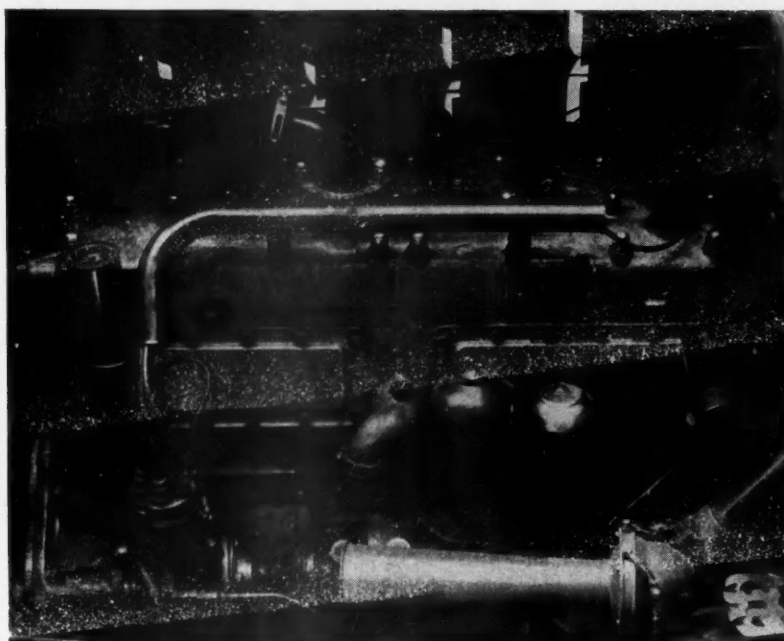
Cutting a groove in face of ring increases unit pressure

Grooves, bevels and drain holes to curb oil pumping

Oil pressure expands width and diameter of hydraulic rings

Oil goes through slots or holes to groove

*An  
Analysis of the  
Opinions Held  
by Truck Factory  
Engineers*



## Air Cleaners Must be Efficient to Really Protect the Engines

ONE Senor Villa boosted the cause of air cleaners in a big way back in the days just before the United States entered the World War. He had, of course, no intention of influencing the automotive industry in any way but when his antics brought about General Pershing's expedition into Mexico he set a lot of truck men to serious thinking. The expedition depended to a large degree upon motor transport and it had not penetrated far into Mexican territory before it became evident that the life of the motor vehicles depended upon finding protection against dust-laden air. Strange tales filtered back of convoys of trucks enveloped in clouds of dust—of their

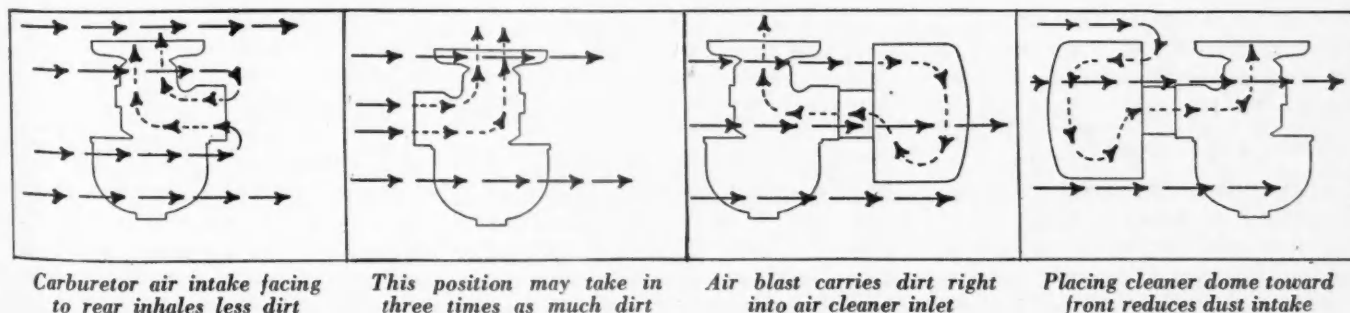
**Optional heavy duty type is favored for installation on dump trucks and others which are operating under very dusty conditions.**

own raising—like fog, of engines worn out in a few days, of choking drivers and of frantic efforts to devise air cleaners out of nothing at all.

Fleet operators have learned in less spectacular fashion in times of peace that trucks unprotected against the ravages of dust do not long survive. Engines in trucks hauling bulk cement

may be ruined in short order, quarry service lengthens the life of no engines taking in raw air and dump trucks suffer severely from the effects of dust. On one road job new cylinder blocks and pistons lasted but 3000 miles during the period before air cleaners were installed. On another dump truck operation engines were worn beyond reboring in less than 500 miles.

Even engines equipped with air cleaners are not immune from excessive wear under certain conditions. Idling may be especially harmful. Some cleaners are not effective when handling the small quantity of air required for idling, on some engines the idling air





enters through a separate hole which is not connected to the cleaner and in many instances there are small leaks of air in pipes or tubing between the cleaner and carburetor, or in the carburetor body itself as around a worn throttle shaft. To meet these conditions many owners direct drivers to stop engines while trucks are being loaded or unloaded.

Engines operating under exceptionally bad conditions are, paradoxically, relatively safe. The conditions themselves warn operators to beware, the need for protection is obvious. Not so with the thousands and thousands of trucks which operate under more nearly normal conditions. Working without air cleaners, they wear out faster than the normal rate but the difference is not great enough to alarm the owner.

"If engines developed hay fever, like humans, to show that they are suffering from dust they would warn us of danger," explained one operator. "But the engine goes right on taking it and it is not until later that we find worn intake valve stem guides and piston rings that convince us that something is wrong."

Factory sentiment, as revealed in a recent survey, is overwhelmingly—in fact unanimously, in favor of protecting engines from the evil effects of dust. Air cleaners are standard equipment on all but one of 23 makes of trucks included in the compilation which comprised all price classes. Four engine manufacturers also strongly favored air cleaners.

Trucks operated under "particularly severe and dusty conditions" should be adequately protected against damage according to the opinion of each of the manufacturers responding to the survey. The one make of truck not regularly equipped with an air cleaner is supplied with a heavy duty type cleaner at extra cost for dusty conditions. Several makes of trucks are regularly supplied with a heavy duty type cleaner and therefore no change is made on trucks going into dusty service. Other factories supply one type of air cleaner for ordinary service and another type for severe conditions.

Sentiment among truck and engine factory engineers in favor of efficient air cleaning goes so far as to condemn makeshift cleaners. One engineer boldly states "Frankly, I do not feel that these types of cleaners ('tomato cans') do a great deal of actual good." Another adds "We do not believe that the old plain cans are of much good at all."

The oil bath type of cleaner is preferred by a substantial majority of the engineers who commented on the subject of cleaners. One engine maker insists on an oil bath type cleaner for

engines used in dump trucks, and the other engine builders recommend the same type for severe conditions, except one which speaks in favor of a washed hair type.

The vote for an oil bath type cleaner for dusty conditions is almost unanimous among the truck engineers. Only three of those responding fail to recommend the oil bath air cleaner for severe service and one of these supplies this type of cleaner on all models for all types of service.

The position of the air intake under the hood may lessen or increase the amount of dust taken into the engine intake system according to A. H. Hoffman Agricultural Experiment Station, University of California who tested many different types of air cleaners. A mere reversal of flow of air helps to take out solid particles. As shown in the drawings, less dirt will be inhaled by a carburetor with the opening to the rear of the vehicle than by a carburetor with opening facing the fan blast. Likewise with cleaners as shown it is better for the head of the cleaner to extend into the air blast than for the openings to be exposed to the stream. In one test  $3\frac{1}{2}$  times as much dirt was taken in by the inlet facing the radiator as by an inlet facing in the opposite direction.

The value of air cleaning is demonstrated in the reports submitted by the University. "Numerous road tests made by various operators of stage lines and fleets of motor vehicle have shown that, if dust is kept out, the wear of engine parts will be reduced to about three-fourths in some machines and in others sometimes even to as little as one-eighth of what it would be for equivalent use without protection against dust."

No further proof is needed of factory interest in air cleaners and from the same source comes evidence of greater interest on the part of fleet owners. A few years ago many operators did not take air cleaners too seriously and they paid little attention to maintaining them. But now the situation is changed. One factory engineer says "We find that as a general rule the fleet owner is fully cognizant of the value of an air filter and emphasizes to his operating staff the necessity for careful maintenance." Another tells of improvement saying "We find that operators are becoming better educated with regard to the necessity for care of cleaners every day."

Proof seems conclusive that if any truck engine suffers from "hay fever" or comes to an untimely end from inhaling abrasive material that its plight is unnecessary and contrary to good fleet practice.

## Wise Words From a Sales Manager's Notebook

(CONTINUED FROM PAGE 22)

rive at the point many times in his career where he questions the price of his own product, and begins to doubt its value in proportion to its price. He is told many times a day his price is too high. Multiply this by weeks and months and if he is not careful he will be sold on the idea. This tendency however, creeps into form only when sales are slow. The best cure for this condition is a realization of the fact that hundreds of other men in his own organization are selling the same truck at the same prices. Price objection in the large percentage of cases does not mean that the buyer thinks your price too high for the value received, but it is only natural that most buyers should like to buy your products for less than you ask and they, of course, make every effort to do so.

**T**HERE is a strong tendency with many experienced salesmen to change their procedure and sales talk, sometimes getting away from fundamentals. Now don't misunderstand me, it is important and necessary to keep abreast of the times, to acquire new ideas and to be well posted on the trend of things. But why discard good plausible and practical conversation which has many times hit the mark simply because it becomes monotonous for you to say the same things over and over again. If good common sense statements work well, why not keep using them?

I have heard some salesmen with fairly good records leave a sales meeting where the manager almost exhausted himself trying to get over certain sound practical points to his men, saying, "Well, the same old stuff." Not that they did not respect their manager but they were a little disappointed in not hearing some entirely new arguments. In their anxiety to learn something new, a magic wand type of sales chatter, they overlooked the important fact that in human nature there is very little that's really new, and that love, hate, pride, fear, jealousy, greed and impatience are all "old stuff" yet we must treat with one or the other almost constantly.

In sales technique it is not a matter of how old, but rather how good.

Nearly every salesman today faces the almost daily problem of keeping himself sold on his job, and these uncertain thoughts are usually aggravated by some unpleasant incident, a disagreement with his boss, the loss of business strongly expected, or an accumulation of petty annoyances. Sales-

(TURN TO PAGE 34, PLEASE)

## FREE TO READERS

*Commercial Car Journal* will be glad to procure expert legal advice for any reader who is faced with a legal problem involving a motor truck. There is no charge for this service. Inquiries made in confidence will be so honored. Just address your letters to The Editor.

### Bond Requirement Upheld

*Finn et al. v. Railroad Commission of California, District Court.*

THE requirement of the Motor Transportation Agent Act compelling the agent to furnish a bond as a condition to the granting of the license is "not an unreasonable burden" nor violative of the Fourteenth Amendment. Such a provision to meet the known conditions prevailing upon the highways of the state is a valid exercise of the police power.

### Restricted Haulage—Contract

*Merchants Mutual Assn., Inc., v. Matthews, Florida Supreme Court.*

A CORPORATION organized for the express purpose of hauling by its motor trucks the goods of its stockholders only and under its charter at cost without profit held to successfully eliminate itself from the classification of common carriers, but, by the charter's term and by reason of its contracts with its stockholders, it comes within the provisions of the statute regulating "Private Contract Carriers."

### Faster Time Not New Service

*Central Truck Lines, Inc., et al., v. Railroad Commission et al., Supreme Court of Florida.*

UPON the filing of an application by a motor carrier for a change in time schedule, it was contended that the changes would, if granted, permit the giving of a new service different from that authorized in the certificate under which it had been authorized. The court held that this was not the granting of a new service, but rather the granting of the right to furnish a better service and was valid exercise of the Commission's power.

### Georgia Cities Can't Tax

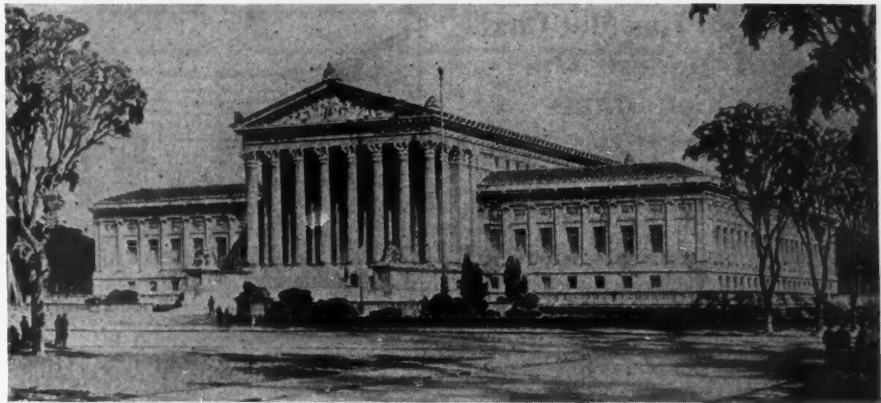
*City of Savannah v. Georgia Highway Express, Inc., and V. C. Ellington Co. v. City of Macon, Georgia Supreme Court.*

GEORGIA cities may not levy any tax upon motor carriers in addition to the license and mileage taxes paid the state.

### Legal Length Limit Broken

*Park Transportation Co. v. State Highway Commission, Missouri Supreme Court.*

A CONTRACT hauler engaged in hauling road material over irregular routes and now and then transporting from supply houses overlength loads of



Architect's drawing of U. S. Supreme Court Building, Washington, D. C.

# Court Decisions in Truck Cases

road material for use in construction of the state's highways claimed a right to so engage in transportation without Commission permit. The Commission denied this claim and would issue the permit from only the nearest railroad point to the place of the highway construction, it was alleged. The court sustained the Commission, citing *Stephenson v. Binford* relative to conservation. The hauler was held not to come within the statutory exception of vehicles temporarily transporting road making machinery, road material, etc.

### "Motor Driven Car" Is Truck

*Conyard v. Life & Casualty Insurance Co. of Tenn., N. Carolina Supreme Court.*

IT has been held that the term "motor driven car" is broad enough to include a Chevrolet 1½-ton truck within the meaning of an insurance policy in suit. When an insurance policy is reasonably susceptible of two interpretations, the rule of construction is that the one more favorable to the assured will be adopted.

### How R.R. May Use Trucks

*Lake Motor Freight Line, Inc., v. Public Utilities Commission, Ohio Supreme Court.*

IN an earlier case it was held that the New York Central, if it were to operate trucks over the highway, would become a motor transportation company subject to the requirements of convenience and necessity. It was denied a certificate of convenience and necessity on the ground that the facilities were already adequate, the court holding that the railroad was in no different position than any other applicant. In this action the order of the Commission granting a certificate to a motor carrier extending his

route so that he could haul the goods of the railroad as it had originally planned to do itself was upheld.

### Revocation of Certificate

*Midwestern Motor Transit, Inc., v. Public Utilities Commission, Ohio Supreme Court.*

IN sustaining the Public Utilities Commission's revocation of a certificate of convenience and necessity, the court held that the violation of law and orders of the Commission and failure to comply with provisions relating to carrying of public liability insurance were sufficient to justify the revocation. The Commission may revoke intrastate certificates for violations regardless of effect on interstate business of the carrier.

### "Carrying Capacity" Defined

*Campbell et al. v. Cornish, Oklahoma Supreme Court.*

THE Tax Commission was held to be without authority to provide for any different classification of motor trucks for registration purposes other than those set forth by the legislature. The court held that the term "pounds carrying capacity" means the manufacturer's rated capacity and not the Tax Commission's requirement of a "declared capacity" nor "actual capacity." It was further held that the Tax Commission requirement that where a trailer was used it should be computed with the truck as combined carrying capacity for the entire unit as the basis for registration was unauthorized as the law did not provide for a combined carrying capacity of different units and the Tax Commission had no power to invoke such a requirement.

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## Ring Design Has Met Challenge of Modern Operating Conditions

(CONTINUED FROM PAGE 30)

of those days was no small increase in oil consumption, but leaking of enough oil to foul plugs.

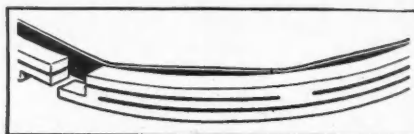
The plug manufacturers sprang to the rescue with plugs designed to be happy in an oil bath, plumbing shops were raided of fittings which raised the ends of the plugs out of the oil zone, the patent office received stacks of applications for means of controlling oil. Maintenance men took orders to cure oil pumping with misgivings; owners made mean remarks about the ability of mechanics and shop superintendents who could not permanently cure misses in engines.

The whole mess could not be blamed upon excessive revs because engines which turned in what would now be considered leisurely fashion fouled plugs with glee—seemingly with malice.

Whereupon engine revolutions started to increase, per minute and per year. The first, because designers stepped up revolutions per minute by way of getting more performance per cubic inch of piston displacement and per pound of engine weight. The second because operators increased average road speeds, chasing trucks over the road hour after hour at 30 and 40 and even more m.p.h.

Present day rings embody features evolved during trying times. Engineers who grappled with the problem do not hesitate to admit that there was a lot of "trial and error" in their work. But it was not aimless try-anything-once development. All concerned sought the causes of the troubles and then the remedy. Hence, came the idea of controlling compression with one or two, or three rings, and controlling oil with one or two other rings and the idea of designing rings for worn engines.

Looking back over the development of piston rings during these few years one principle stands out in the host of designs. That is increasing the unit pressure of the ring face on the cylinder wall, or the oil film. With a given total tension of the ring the pressure for any unit of the ring face, as a square inch, is determined by the total area of the ring which bears against the cylinder wall. Cutting a groove in the face of the ring does not increase the total tension, but it does practically double the unit pressure. The early scraper rings, therefore, were effective largely because they possessed higher unit pressures which reduced the amount of oil which passed them. Cutting a bevel on the top or bottom of the ring also increased the unit pressure. Both grooves and bevels were advocated as means of



*Staggered slots permit this ring to vary in width to fit the groove*

controlling oil because they provided space in which the oil could be collected no matter what happened to it thereafter, but in any event carving the ring face increased the unit pressure.

A logical step in controlling oil was to admit that too much might gain admission to the clearance between the piston and cylinder wall, and to drain the surplus back into the crankcase by way of the inside of the piston.

Piston ring designers displayed much ingenuity in working out this problem. The unhonored egg-beater drill hero opened a path for the oil which worked its way behind a ring to escape into the inside of the piston. Chamfers just below rings were tried without drains, but it was but natural that drain holes should be bored in these chamfers. Drilling holes and cutting slots right through the rings themselves, with or without drain holes in the rings grooves were adopted for the same purpose.

Inner rings or expanders supplemented the higher unit pressure idea by raising the total tension or by preventing it from dropping as much as otherwise would have decreased. Some of the old timers tell tales of corset steels being used to boost ring tension. (Ask your mother or grandmother what a corset steel was.) Many inner rings now are used to prevent collapse of rings at high speed, rather than to boost ring tension.

To overcome taper and out-of-round conditions rings were made more flexible so they could conform to cylinder contour and they were supplemented by inner rings for tension. To overcome wear in the piston grooves rings which expanded in width were developed.

The practical limit on unit pressure is cylinder wall and ring wear and adequate lubrication. Too high unit pressure imposed a penalty in wear and loss of power.

Forcing the oil, which the ring is controlling, to control the ring, in turn, is the basis of the hydraulic principle of design. Oil passing through slots or holes in the ring tends to force the ring outward if the groove is not drained or only slightly drained. This force increases as piston speed increases which is as the designer would have it. The same principle is applied in the sectional hydraulic ring which is made in two pieces, one on top of the other. Oil entering between the top and bottom section tends to make the ring wider, thus filling the groove.

## Wise Words from a Sales Manager's Notebook

(CONTINUED FROM PAGE 32)

men who are confronted with the task of deciding just whom they should work for or what other company offers the most opportunities should remember that they themselves make the opportunities regardless for whom they work. A definite "goal" ahead and a determination to accomplish a set purpose for their present employer plus consistent hard work will eradicate these uncertainties of thought.

**S**ELLING trucks will never become a cinch. Human nature will always be about the same, and selling resistance will ever be before us. Competition will always be keen. Price in most cases will be used as the excuse for losing an order. The prejudices, reciprocity, questionable management, personal likes and dislikes, differences of opinion and all the other hurdles we have had to jump in the past will be with us in future sales work. Successful salesmen of the future will learn as successful salesmen of the present have that all problems must be met with courage, fortitude, faith and confidence in ourselves, that they must meet obstacles and resistance resourcefully, constantly studying ways and means of best overcoming them. Conditions you are not responsible for and that you have not the power to change, accept as facts but don't permit them to restrict your effort. You are constantly going up against strong resistance and frequently with very little assistance; but keep up your courage, "good pilots are made in stormy waters." Every sales obstacle you overcome will make you that much stronger for the next one. I am firmly of the belief that any man in sales work who does not blame himself to a great extent for losing an order is far from being a real salesman.

This business of selling is just as important, just as honest and dignified as the business of buying, and salesmen who know the truck business command respect, and if they speak clearly and see a lot of people the law of averages will take care of the commissions.

The road ahead is broad and wide open, and opportunities and earning power are limited only by effort exerted.

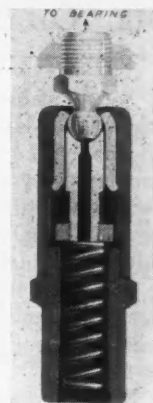
Real outstanding sales ability is the only thing I know of today where the demand greatly exceeds the supply.

With the vast potential buying power in this country ready to buy in enormous quantities, the salesmen of tomorrow will find an abundant reward, which will be in direct proportion to the selling ability he has developed in recent months.





Toledo pump for Ford A and AA



Alemite fitting has tight grip

## \$ALVAGE—from a Shop Man's Mail

Being the impressions and reactions of an experienced shop man to new products offered by manufacturers. The editor will gladly put readers in touch with the makers mentioned.

• Something which strikes me about announcements of the flock of new products is the way manufacturers play up the practical features—saving time or avoiding trouble or doing a better job and so on. And most of them explain how it's done. For illustration—

### Reinforced Gasket

• Fitzgerald Mfg. Co. presents a new cylinder head gasket for extra heavy duty which is reinforced with metal, something like concrete. Top and bottom are copper, as usual, but there are two sheets of asbestos instead of one. A metal insert, called "Metal Kore" which is placed between the asbestos sheets has barbs which hook the sheets together to stay. The "M" type gaskets are made for passenger cars, too.

### Grinders Quartette

• Four different kinds of grinders crave business. Black & Decker offer a rig for grinding Stellite and hard alloy valve seats. The driver spindle vibrates a few thousandths of an inch at each turn. The B & D self-centering pilot steers the stone. The outfit, including driver, stone truer, stone sleeves and three sample stones lists at \$75.00.

Hall presents a concentric (meaning not eccentric) grinder with a micrometer stop limit which stops grinding at depth set. Wheels and pilots are interchangeable with Hall eccentric outfits. The new outfit, called Model C, is priced \$65.00 without pilots or stones.

Honors for winding up go to a new Madison-Kipp Corp. grinder which weighs only 7 oz. and revolves at 40,000 per minute. The number is right. It drives a little wheel for light grinding.

Sunnen Products Co. has added a motor driven grinder for hydraulic brake cylinders ranging from 1 to 2.125 in. in diameter. It can be converted for handling piston pin holes, spindle bolt bushings, etc. This company is giving a \$4.50 set of burnishing brushes with each engine cylinder grinder.



### Horse Shoe Tamer

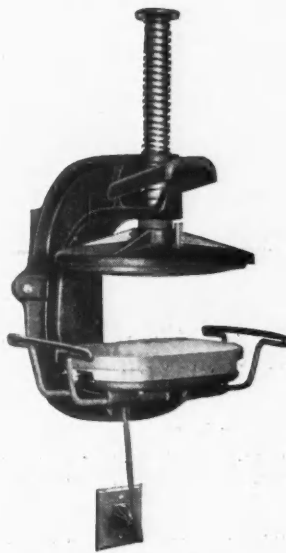
• Sunnen pliers for valve locks of Ford V-8s and other horse shoe locks have exceptionally long handles and spring tension.

### For Engine Mechanics

• A new catalog by Ray Day Piston Corp. lists cars and engines alphabetically and includes number of cylinders, diameter of piston pin and number of rings of each. Piston specifications and list prices are not omitted. A copy of the catalog will be mailed upon request. Not included in the catalog are the racing pistons which came home with first, second and third places in the annual Indianapolis race.

### A Wind Cheater

• Streamlining, predicted by C. C. J. editors, features a new semi-trailer by Fruehauf. The front is round, the roof is rounded and the rear is a rounded flare. Doors are flush on the side and of double type. Low height of floor is due to a drop frame. The spare tire is carried within the sloping rear. The job has 800 cu. ft. capacity.



Dill tube vulcanizer uses electric heat and pneumatic pressure

### An Ancient Art

• Back to the days of the Egyptians, say 4000 years, dates the idea for a resinous binder for brake lining developed by World Bestos Corp., makers of Grafilid linings. This binder prevents the lining from becoming hard or glazed or scoring.

### The Fume Catcher

• Ear-to-the-Ground fans who wondered who makes the fume catcher mentioned in the July issue have their answer in a pamphlet from Motor Fume Utilizer Corp. Address 169 Leonard St., New York.

### Bull Dog Grip

• More than one big number this month. Forty thousand is a lot of revs., 10,000 lb. is a lot of pressure. It's what the new Alemite hydraulic lubricating system is designed to handle. A new fitting has a ball end which engages with a new type connection which has three jaws actuated by a plunger. When pressure is applied to the grease it forces the jaws around the ball end and the higher the pressure the tighter the grasp. The operator need apply no pressure to the connection even at high pressure.

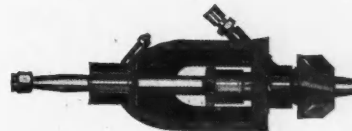
The company expects fleet owners to change fittings to the new style and it has an adapter for existing equipment.

### Bends Them Cold

• A. E. Feragan, designer of the "Weegee" board for checking front end alignment, has a new product, a front axle straightener. The straightening is done cold and the machine will handle any axle or housing which will give in to 50 tons pressure. Steering knuckles and backing plates are kept in position during the operation. The maker is Bendix-Feragen Division of Bendix Aviation Corp.

### Hinge Pin Extractor

• Hammers, punches and skinned knuckles are not the proper tools for driving out door hinge pins, says Kent-Moore. It manufactures a press which breaks the pin loose and then forces it out of the hinge. A heavy screw operated by a ratchet wrench puts on the pressure.



### Anti-Rust Pump Shaft

• Wholert Corp. pumps for Fords and Chevrolets embody carburized hardened shafts which are made with an integral chrome shell. Body and impeller are made of chrome-nickel alloy.

## MR. COLLINS PROPS HIS REPLACEMENT PLAN AND ANSWERS SOME CONTENTIONS

(CONTINUED FROM PAGE 12)

Some maintenance curves show a rapid rise during the very early life of the truck and then flatten out or increase very slowly. This is probably the result of the same psychology which motivates the school boy. He polishes, oils, and adjusts his bicycle three times a day when it is brand new. After he has had it six months, he throws it down wherever he gets off and leaves it out in the rain.

R. W. Knowles has presented an interesting situation in his Chart B (page 19, July *Commercial Car Journal*). This is for a truck which has cost \$4,000 new and for which the maintenance component has been constant at four cents per mile for more than 100,000 miles. Mr. Knowles believes that the economic life for the truck would be at least 250,000 miles. He has not shown the gasoline, oil and tire components. With a horizontal maintenance component, these other three might not be constant, they might increase sufficiently to make the economic life much shorter than 250,000 miles. But assuming that they are constant and that the life is 250,000 miles, the total cost for maintenance at four cents per mile is \$10,000, which in itself is very interesting.

### • The Upkeep Question

Here is an anomalous situation. Out of \$14,000 spent on the truck, only \$4,000 or 29 per cent would be spent with people whose business it is to make trucks, and \$10,000 or 71 per cent would be spent in repair shops. It must be true that a truck maker can provide much more transportation value per dollar than a repair shop can. Then why is a greater bulk of the money not spent with the truck maker?

If such situations, as Mr. Knowles cites, are common, the truck makers have before them a golden opportunity for themselves and for their customers if they will recognize it. The truck makers and their customers would both benefit if their trucks were designed so that maintenance became only a minor part of the total cost for equipment.

The question has been asked whether or not it is necessary to the solution for the economic point as given in the previous article, for the straight line maintenance component to be a straight line beyond the point of intersection. It is not necessary that it be a straight line. So long as it falls along or above the line shown on Chart A, the solution for the economic point still holds. The component on Chart A beyond the point of intersection is merely a reflection of the initial investment component about a

horizontal line through the point of intersection. Such a maintenance component would cause the cumulative total cost per mile to be a constant beyond the economic point. It has already been shown that one is better off to dispose of a truck under such conditions.

If a truck is run quickly to the end of its economic life, obsolescence probably has little or no effect upon the general solution for the economic point. However, obsolescence may become important when the economic life covers a long period of time or when there are very rapid advances in truck construction or design. The term "obsolescence" may mean many things. As applied to the determination of the economic point in this study, however, it is taken to mean only one thing. That is the phenomenon of new equipment being able to do the same job as the old equipment, but at a lower cost per unit of output. From this definition it must be clear that obsolescence influences the solution only if the cumulative total cost per mile at the economic point for the new truck is expected to be lower than the combined instantaneous costs per mile for gasoline, oil, tires and maintenance of the old truck at the time when the replacement is contemplated.

As an example, consider the truck represented in Chart 2. Suppose that when this truck had reached 40,000 miles, the question had been raised as to whether or not it would be cheaper to replace it by a new truck even though the economic point had not been reached. To warrant the replacement, it would be necessary for the new truck to have a cumulative total cost per mile at its economic point equal to or less than the combined instantaneous costs

per mile for gasoline, oil, tires and maintenance for the old truck at its 40,000 mile mark. From the chart these are found to be 2.2 cents per mile for gasoline and oil and 1.2 cents per mile for tires. Since the maintenance component is not a horizontal line, the instantaneous cost per mile for maintenance cannot be read directly from the chart; it can be calculated from the data shown, nevertheless. It is found to be 5.6 cents per mile. The sum of these is 9.0 cents per mile. Therefore, to warrant replacing the old truck at 40,000 miles the new truck would have to have an assured cumulative total cost per mile at its economic point less than 9.0 cents. This is the general solution for the economic point when obsolescence is an important factor.

Incidentally, it may be interesting to point out that the combined instantaneous costs for gasoline, oil, tires and maintenance at the economic point have the same value as the cumulative total cost per mile at the economic point, as would be expected. In this case, 10.8 cents per mile.

### • Squeezing Out Lemons

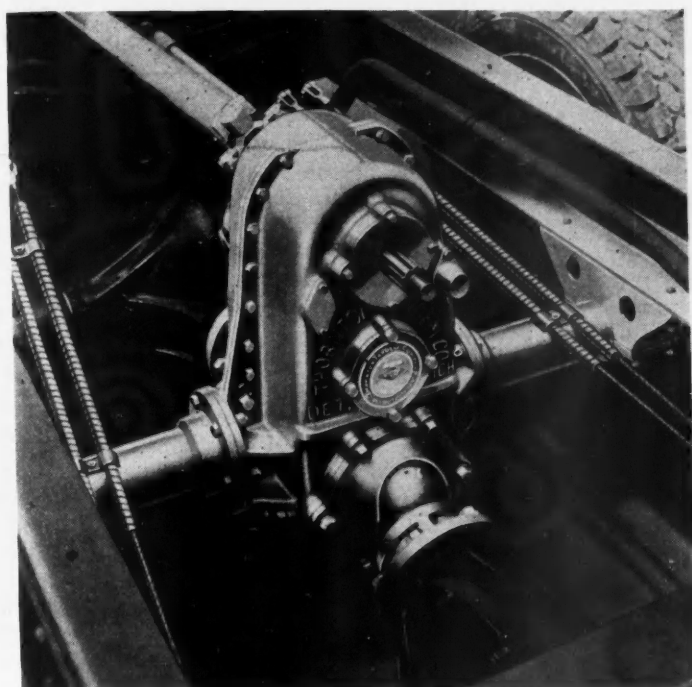
If the new truck does the old job more quickly or saves driver expense, etc., these are also factors speeding the replacement of the old vehicle, but in any case they must be considered as the individual situation arises. It might be mentioned in passing, however, that the method just described may also be used to calculate the point at which to replace a truck which has turned out to be a "lemon" as compared to the other trucks in its group or to replace trucks of one manufacturer by those of another which promise to be more economical.

Although the investment component has been thought of as a depreciation curve, it is not that. It is merely a graphic way of showing what would have been the average cost per mile for investment had the truck been discarded at 40,000 miles, 50,000 miles, 60,000 miles, etc. This curve would not become zero until the mileage had become infinite. Depreciation curves represent various methods used by accountants to write off equipment.

The accountant knows that equipment must eventually be disposed of. Depreciation curves merely represent his way of determining the residual value of the equipment when he sets up the assets for the financial statement. The accountant's depreciation curves should not influence the determination of the economic point. Rather, depreciation curves should reflect the economic operation of the equipment.

### Look for These Features in the September Number

- Report of the S.A.E. Annual Transportation Meeting which will be held in Chicago, Aug. 28, 29, 30.
- Articles on crankcase lubrication by a fleet operator and an oil chemist.
- A review and discussion of what truck manufacturers are doing and can do to provide more load-carrying capacity and more load space within present-day legislative limits.



*The transfer case which is carried on cross tubes provides ratios of 1.176 and 2.023 through helical gears*

## Thornton Has Two-Ratio Four-Wheel Drive Axle Unit

Standard axles are used in assembly which includes a third differential

**T**HORNTON TANDEM CO., Detroit, Mich., is announcing to the trade its entry into the six-wheel unit field with a two-ratio four-wheel drive axle assembly for light trucks.

The unit consists of two standard production axles, a two-speed transfer case with two trains of helical gears, between the axles, two constant velocity high angularity universal joints (needle bearing high angularity joints available at slight reduction in price) between the transfer case and the axles, helical gears throughout in the transfer case, dual chrome alloy springs on each side, pinned to axle brackets and mounted on trunnion brackets supported from the frame at either side.

A third differential (Timken high traction) is incorporated in the transfer case to distribute driving torque equally to forward and rear axles—at the same time permitting free relative movement of the two axles.

The unit can be applied to practically any type of standard two-wheel drive truck that provides facilities in the rear axle to permit its operation in either direction without undue strain.

The course of drive is through the propeller shaft to the top of the transfer case. From here the drive is taken through either train of helical gears engaged to the output shaft at the bottom of the case. The driven gear on this shaft is mounted on a Timken high traction differential to transfer torque equally to both forward and rear universal joints.

Reduction ratios in the transfer case are 1.176 and 2.023, for the respective gear trains. All shafts, etc., are

mounted on Timken taper roller bearings. Shifting is by means of a sliding jaw clutch on the transmission main or top shaft, engaging the gears which rotate freely on roller bearings on this shaft. The shift of course can be accomplished without bringing the truck to a complete stop, through this provision. An opening for a power take-off unit is provided near the top of the case.

The constant velocity Bradley universal joints have provision for taking end-thrust, and an automatic take-up by means of a spring load. The joints are pre-loaded in assembly. The maximum useful angularity of this joint is said to be approximately 30 deg. which is also stated to be considerably beyond the requirements of the Thornton drive unit.

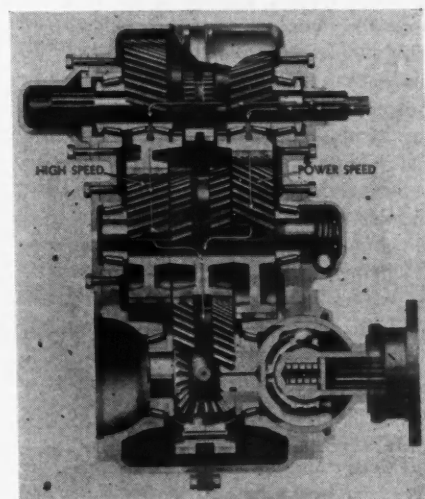
The transfer case is carried on short cross tubes from brackets attaching to frame side rails. These cross tubes also serve as mountings for the trunnion assemblies at either side, carrying the dual springs.

Springs are pin-shackled top and bottom at their outer ends to brackets which in turn are free to rotate about the axle housing. When the unit is attached to a truck frame, gusset plates are provided to obtain the proper frame load distribution. These gusset plates are approximately seven in. long with  $2\frac{3}{4}$  in. flanges.

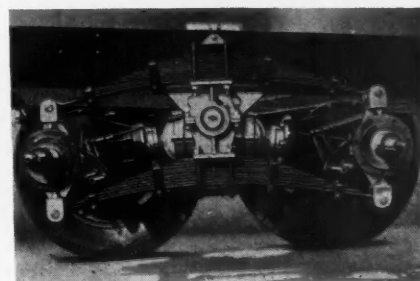
The Thornton company recommends the use of a 157 in. wheelbase truck for conversion to a Thornton drive unit either of 140, 157 or 171 in. wheelbase.

Brakes are of standard design as used by the manufacturer of the truck in-

volved. Operation of the brakes is by means of cables at the six-wheel unit. Wheels and tires are not included in the standard unit but are obtainable in any standard sizes at additional cost.



*Ratios of the transfer case are engaged by an internal-external gear type clutch. Both pairs of gears are helicals. The third differential is a Timken*



*Two semi-elliptic springs are attached to brackets free to oscillate on the axle housings*



## TAKE THESE TIPS FROM AN EXPERT AND DEFLATE FLEET TIRE COSTS

(CONTINUED FROM PAGE 29)

air in the tire as it is to put it in. There are no valve insides made that will hold air under the high pressure used in pneumatic truck tires without the aid of a valve cap. The only way to prevent a valve leak is to seal the valve with a cap.

When dual tires of the same overall diameter are operated on ordinary crowned roads the inside tires carry 15 to 25 per cent more of the load than the outside. The inside tires do not give as much service as those on the outside. This trouble can be largely overcome if the dual tires are matched so the outside tire is about  $\frac{1}{4}$  in. larger in diameter than the inside.

New tires should be applied on the outside with worn tires on the inside. Some operators apply new tires on the inside and the old worn tires on the outside, reasoning that the old tires will fail first and being on the outside are easier changed. This is very poor practice as the new inside tire may be required to carry as much as 50 per cent more load and therefore fail first.

When spare tires are applied on dual wheels, the service man should at the first opportunity check to make certain that the tires are properly matched.

When tires of the same overall diameter are matched as duals, the outside tire should be inflated to 5 or 10 lb. more than the recommended pressure. For example, if dual 9.00 tires are used, the inside should carry 65 per cent and the outside 75 per cent. The difference between the pressure of the two tires should be established in accord with the amount of crown in the road.

During hot weather it is good practice when operating on highly crowned roads to use 5 per cent less than recommended pressure in the inside dual. This is recommended to offset the pressure increase due to the higher temperature of the inside tire.

The service man should examine the tires on every truck that enters the garage and see that the tires are in serviceable condition before it is taken out. In some large operations it is required that on entering the garage the truck be driven directly to the gas pump and the tire man inspects the tires and gives his approval before the truck can proceed.

In addition to the inspection made when the truck is being oiled and gassed the tires should be carefully inspected daily when being checked for pressure. At this time any tires that are worn out—showing signs of failure—or need repairs should be removed.

It is possible to increase the average mileage by shifting the tires to different wheel positions. Tires on the front

wheels often show excessive and peculiar tread wear caused by the camber and toe-in. Front tires are not subjected to the stresses of driving and braking nor the excessive overloads due to sidesway. Rear tires which are subjected to much more severe service often fail before the tread is worn off. By shifting the tires to different positions it is often possible to increase their service and secure 100 per cent tread wear before the fabric body of the tire fails.

The tire service man should be responsible for the condition and use of chains. In the winter time when chains are necessary they should be applied and serviced by the tire man.

Trucks equipped with dual tires seldom require chains except when the road is covered with ice or sleet. When chains are used on duals it is usually sufficient to apply chains on the outside rear tires only.

Front wheels should be checked for alignment at regular intervals as misalignment causes excessive tread wear. If the wheels are very badly out of alignment the tires will wear off in

a peculiar way which is readily recognized by an experienced tire man. The wheels may, however, be out enough to cause considerable excess tire wear without showing the characteristic misalignment wear.

The service man should keep records of abused tires and report them to the superintendent. Under abused tires should be listed tires:

Driven flat, skidded in braking, curb worn, bruised, injured by scraping body or some part of chassis.

Drivers should be taught that a tire is generally ruined if run flat for only a short distance. When one of a pair of dual tires goes flat the damage is usually not so serious although if run far the inner tube is generally destroyed and the other tire is so heavily overloaded that it may be seriously damaged.

The brakes should be properly adjusted so that they do not grab or lock on one wheel, the drivers should be taught the economy of careful braking. Tires injured by braking often show spots where the tire is worn away by skidding. Even though the tires may not have definite spots where they have been skidded a close examination may show the tread rubber roughed up in fine ridges which indicates a slippage even though the tire continued to roll. This condition indicates excessive and in most cases unnecessary tread wear. The excess tread wear caused by severe braking is very noticeable but the more serious stresses on the cotton cords which compose the body of the tire cannot be seen until the tire fails prematurely.

**EDITOR'S NOTE.**—This subject was discussed along similar lines by Mr. B. W. Elgin, National Account Representative, Firestone, before a meeting of the Commercial Vehicle Operators in New York City. Additional information given by Mr. Elgin and by fleet operators during the discussion follow.

Sustained high speed on a cross country trip increased pressure in 9.75/22 duals from 65 lb. to 90 lb. and it was necessary to let out some of the air. Mr. Elgin said.

A large fleet operator asked whether Mr. Elgin recommended carrying higher air pressure on the outside tires of dual installations on trucks operated on city streets and main highways without crowns. Mr. Elgin replied that equal air pressure on both tires was advised on roads without crown.

Few of the fleet operators present said they had air pressure checked every day. Most of the operators favored semi-weekly or weekly tests of pressure.

### How About a Registration Code Based on Tires

(CONTINUED FROM PAGE 28)

capacity as a basis for registration, and also for collection of the license fee.

This can be made a very simple procedure by requiring the applicant for a license to submit to the registration bureau an affidavit, signed by a duly established representative of the tire manufacturer, this affidavit to give the necessary information on the size, type and tire manufacturer's total load capacity rating of all tires on the vehicle. This method is suitable for establishing the gross weight of any type of vehicle from the lightest to the heaviest, regardless of the number of wheels and the type of vehicle, whether it is a light-two-wheeled camping trailer or a passenger car, bus or heavy-duty truck or trailer. Sample certificate form suitable for establishing the taxable gross weight of a vehicle based on tire capacity is reproduced herewith.

In view of the fact that in this certificate the maximum gross load capacity rating of the vehicle has been definitely established, the certificate itself attached to the license application, should be sufficient evidence as to the taxable weight on a vehicle without any other investigation, checking or cumbersome methods as necessarily used at the present time.

# COMMERCIAL CAR JOURNAL NEWS

## Sterling Reorganization

A plan to reorganize the Sterling Motor Truck Co. will be acted upon at the annual meeting of stockholders Aug. 14. It is proposed to sell the business and assets to a new corporation, with the same or a similar title. Proposed capitalization is to consist of \$1,000,000 preferred of \$10 par value, plus 60,000 shares of \$1 par common. Purchase from the present corporation is to be paid for in stock of the new company. More than 75 per cent of the creditors have assented to the plan.

## Dodge Spots Representatives

Dodge Brothers Corp. has announced appointment of Harold Bates as truck representative for Detroit city district; C. W. Chapman as Cleveland city manager and George P. Armstrong as representative in the newly-created North Detroit district. J. P. McGearty will be district representative in the Cincinnati region, Nathaniel Stimson in the Louisville district and Ray Simons in Columbus, Ohio.

## Diamond T Makes Record

All monthly sales records in the 28-year history of the Diamond T Motor Car Co., Chicago motor truck manufacturer, were shattered in July, E. J. Bush, vice-president announced.

## Winchester Leads Club

The Motor Truck Club of New Jersey elected following officers: John F. Winchester, president; Charles J. Roemer, vice-president, and David Harper, treasurer. Under the leadership of Mr. Winchester it is planned to broaden activities by holding sectional meetings throughout the state and safety campaigns.

## Victor Boosts Pay

The Victor Mfg. & Gasket Co., Chicago, has increased wages and salaries 10 per cent. The company recently took over distribution of Armstrong cork gaskets.

## Bosch Turns Profit

American Bosch Corp. showed net income of \$41,590 for the second quarter of 1933, compared with net loss of \$76,504 in the preceeding quarter and \$164,720 in the second quarter of 1932.

## Perfect Circle Hustles

Perfect Circle reports all four plants operating at capacity and the foundry at Newcastle running 24 hours per day.

## Tire Output Grows

Production of pneumatic tire casing for May was 66.1 per cent more than April and 35.8 more than May, 1932, according to report of the Rubber Manufacturers Association, Inc.

## Parts Makers Associate

A new association, the Automotive Parts & Equipment Manufacturers, Inc., has been organized to represent parts and accessory makers in their relations with the Federal Administration under the N.R.A. Parts for original equipment or replacement, accessories, shop equipment, service tools and automotive chemicals are the products the makers of which are included in membership. Each product group will be represented on the board of directors.

## Joseph R. Armleder

Joseph R. Armleder, Sr., age 72, former factory manager of the Armleder Motor Co., died July 12. He was a brother of Otto Armleder, president of the truck manufacturing company.

## Personals

J. C. Roper, Jr., Director of Sales of the Ray Day Piston Corp., is making an extensive trip through his eastern sales territory. He will contact distributors, explaining Ray Day's new merchandising plans.

J. W. Frazer, general sales manager, Chrysler Sales Corp., has announced the appointment of Burch E. Greene as director of advertising and sales promotion, succeeding Cliff Knoble who has resigned to head his own business, the Cliff Knoble Business Promotion Corp., 1312 United Artists Bldg., Detroit.

J. R. Hamlin has been appointed assistant sales manager of the Handy Governor Corp., Detroit. Mr. Hamlin, formerly with H. G. Davis, Inc., Handy distributor, Boston.

William J. Kephart is back with Reo as a special truck representative with George W. Laskey, Reo dealer in Philadelphia.

## THESE MEN WANT JOBS

**A-20 (45).** Desires position as territorial or branch manager for truck or equipment manufacturer in Southern territory. Experience as salesman, branch and district manager for truck company extends from 1916 to date. Has good contacts in Tennessee with fleets, national accounts and political divisions. Available Sept. 1, 1933. References furnished.

**A-21 (42).** Man with 16 years' experience designing special bodies and equipment and fleet operation seeks opening for technical or special representative, manager or creative activities.

## Stutz Adds Capital

The Stutz Motor Co. of America, Inc., has sold approximately 40,000 shares of common stock to New York Banking interests to provide inventory capital for the production of Pak-age cars, E. S. Gorrell, president, announced.

## Klemm Names Three

The Klemm Automotive Products Co., Chicago, governor and filtrator manufacturer, has increased its sales staff still further by appointing the following representatives: T. R. Wert, Melville Sears and O. S. Livingston.

## Toledo Makes Record

The Toledo Scale Co. reports sales for July 31 to be the largest volume for a single day in the past five years. Not since June 29, 1928, have sales been so large in one day, and sales exceeded even those of any one day during the peak year of 1929.

## Kingham Expands Plant

Kingham Trailer Co., Louisville, Ky., has started work on a new factory building to contain 80,000 sq. ft. of floor space. The building will contain three assembly lines each more than 400 ft. long. New equipment totaling \$25,000 will be purchased.

## U. S. Allots Road Funds

Secretary of Agriculture Henry A. Wallace has announced apportionment to States of a total of \$30,000,000 for the construction of roads through national forests and public lands. These amounts were allotted for these purposes by the Federal Emergency Administration of Public Works from \$50,000,00 provided by the National Industrial Recovery Act.

## Federal Continues Gain

July sales of the Federal Motor Truck Co. registered the fourth consecutive monthly gain over the preceding thirty-day period, according to J. F. Bowman, vice-president, in charge of sales.

## Ethyl Premium Cut

Oil companies marketing Ethyl gasoline, will reduce the premium on this fuel to two cents above the price of regular gasoline, it is announced by the Ethyl Gasoline Corp., owned jointly by General Motors Corp. and the Standard Oil Co. of New Jersey.

## Highway Shows Trailer

The Highway Trailer Co. is exhibiting, in conjunction with the White Motor Co., in the Travel and Transport Building of the World's Fair, a Kroger grocery trailer with a striking construction and modernistic paint design in conformity with the general architectural scheme structure of the Fair.



## HOW ARE FLEET DRIVERS TO BE TREATED AFTER HAVING ACCIDENTS?

(CONTINUED FROM PAGE 16)

What is done to the driver who becomes conspicuous on account of his accidents varies as much as the method of determining when the driver should have special attention. Three general statements may be made however:

- (a) All companies sometimes employ discipline. For example, any company would discipline a driver by discharging him if he were obviously and grossly to blame for a fatal accident.
- (b) Some companies discipline for every accident, and many do so for every chargeable accident.
- (c) Some companies do nothing to educate or train their drivers.

Reports received from fleet operators indicate that:

- 10 employ discipline exclusively following accidents.
- 2 discipline all drivers for accidents, but also try education in certain cases.
- 4 employ education following all accidents and only resort to discipline in the cases of serious accidents and extreme negligence.
- 3 try education after the first accident, and resort to discipline if this does not have the desired effect.
- 2 make constructive criticisms of the accidents to the driver, give him some general training, and, as a last resort, use discipline.
- 5 companies use discipline sometimes and education at other times; 3 using discipline in about as many cases as education; 1 using discipline much more than education; and 1 much less.

Perhaps one reason why discipline is so commonly used is that it is much the easiest form of dealing with drivers having accidents. To find out what kind of training a driver needs and to effect that training requires considerable intelligence and effort. It is probable also that discipline is more effective now while labor is plentiful than it would be if truck drivers were not so anxious to keep their jobs.

In referring to "education," special work with the individual man is usually meant. This may be coaching in handling the vehicle, reviewing of the company rules or State Motor Vehicle Code, or working out with the driver a better understanding of his duties and responsibilities to his employer, himself, and the public while he is driving. All of the companies reporting were members of the National Safety Council and, conse-

quently, undertook blanket educational work such as the putting up of posters and holding meetings for all the drivers.

States licensing drivers, largely because of widely differing regulations for accident reporting, present a still more heterogeneous picture of the treatment of drivers who had been involved in accidents. As in the case of commercial fleets, a single spectacular accident involving intoxication or serious negligence will universally receive disciplinary action, usually in the form of a court sentence and revocation of license. A number of states, however, have advanced to the point of systematically calling in for hearings drivers who have been involved in several accidents for which no special action had previously been taken:

Connecticut—2 or more serious or 3 or more minor accidents in 1 year.

New York—3 accidents in 1 year.

Michigan—2 or more personal injury or 3 or more property damage accidents in 1 year.

Massachusetts — 2 accidents in 6 months or 3 in any period of time.

So. Carolina—2 or more accidents in 1 year.

Iowa—3 or more accidents in 1 year.

Since states do not require the reporting of all accidents but only those involving more than specified damage or injury, the state figures are not comparable with those of the fleets, and not entirely comparable with each other.

State laws do not provide for anything except discipline (suspension and revocation of licenses) in the treatment of drivers. However, practically all states which undertake to conduct hearings in connection with the suspension and revocation of licenses feel that the gearing is a valuable education experience for the driver whether he is disciplined or not. Thus, in Oregon it is estimated that, although accident reports have been received by the state department for only about a year, two-thirds of the cases are approached from the educational and one-third from the disciplinary standpoint. In Connecticut and Michigan, the educational and disciplinary effect of hearings is estimated to be about equal; and Massachusetts reports that 12 to 15 per cent of the drivers called for hearings because of accidents received discipline in the form of suspensions, and 85 to 88 per cent are "educated" by the discussions of accidents and the warnings given them by the state.

Many fleets and states consider violations of rules along with accidents in

handling drivers. Thus, a serious violation such as drunken driving may receive as much attention as a fatal accident; and a minor violation, such as speeding, would be rated equivalent to a minor accident. In such a case, a driver would come up for special study if he had two or more violations of rules or chargeable accidents per year, for example.

Some states and larger fleets "weight" each accident and violation for record purposes on some such schedule as follows:

Item	Count
Fatal accident	6
Serious accident—personal injury	5
Minor personal injury or serious property damage	3
Minor property damage \$25 or less	1
Driving while intoxicated	6
Hit and run driving	6
Reckless driving	5
Speeding	4
Running signals, signs, etc.	3
Failure to signal	2
Parking, etc.	1

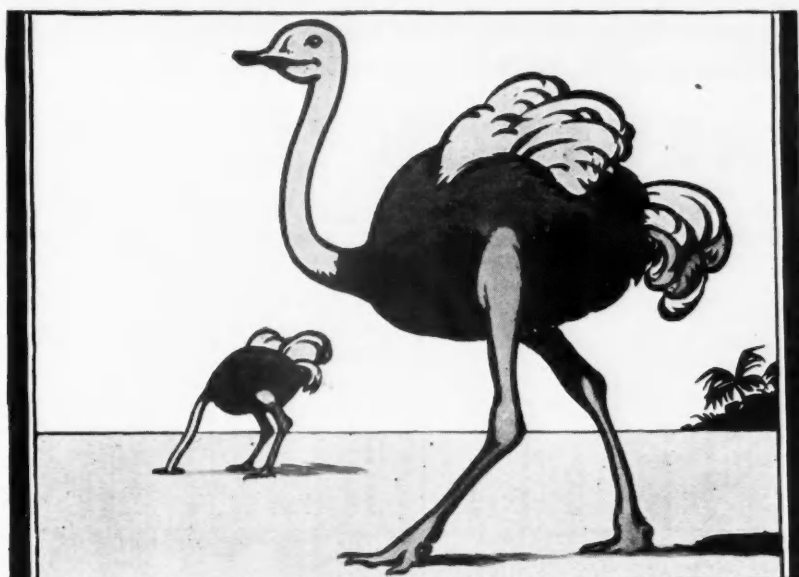
The question of responsibility for an accident does not enter here (unless the schedule is to be used for cash awards or penalties); but as a rule, any man who has received a total of five counts against him should receive attention, and his case should be reviewed again each time he has an accident or violation if the count for that action brings the total against him within the past year (or 13,000 miles of driving) to five or more. Such a system is only necessary or practical in states or large fleets.

Many fleets pay no attention to violations at all. They have no specific rules for their drivers, and drivers involved in violations of laws are simply required to pay their own fines in court. They consider accidents only from the standpoint of reducing expenses. Most large fleets, however, realize that a violation or minor non-chargeable accident may, along with other facts, assist in treating the driver to keep him out of serious or expensive accidents.

Some states, on the other hand, put the emphasis in controlling the driver entirely on violations to the neglect of accidents. A state with a drivers' license law which requires revocations or suspensions for convictions for certain offenses but has no accident reporting will discipline a man for driving while intoxicated but may do nothing about it if he kills someone, unless a conviction is obtained in case of that accident.

While education is often used in trying to improve high accident men, discipline alone is almost universally the rule for those who have many violations.





## *Fable*

**T**HE ostrich, we've been told, is a much-maligned bird. He doesn't really poke his head in the sand to elude pursuers. But that's the popular delusion regarding him.

Millions of owners of cars, trucks and buses like Lockheed Hydraulic Brakes—for good reason. They know Lockheeds give them complete and lasting satisfaction and a totally different type of performance, which they prefer.

Unreasonable? Perhaps . . . but isn't it wise merchandising to give them what they want, since, after all, they're sure they're right? Lockheed Hydraulics *do* have many important advantages. They improve vehicle performance, they lower the factory assembly costs and they afford the easiest, lowest-cost selling.

Why not canvass the possibilities of a switch to Lockheeds . . . suppose we exchange specifications?

HYDRAULIC BRAKE COMPANY  
DETROIT, MICHIGAN, U. S. A.

# LOCKHEED HYDRAULIC

## *Four* BRAKES *Wheel*

*are officially serviced throughout the nation by Wagner Electric Corp.*

# COMMERCIAL CAR JOURNAL'S

CORRECTIONS ARE MADE EACH MONTH FROM DATA SUPPLIED DIRECT BY TRUCK MAKERS

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS				FRAME							
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Transmission	REAR AXLE		Type				
													Gear and Type	Drive and Torque					
1	A.C.F.	160 6	6950	186	222	26000	10170	B9.75/22	B9.75/22	Has 160	6-4 1/2 x 5 1/2	BL 1714	U 4 Op	Tim 76730	2F	R 7.46	52.7	8x3	P
2	175B	6 1/2	8300	186	222	26000	10750	B10.50/22	B10.50/22	Has 175	6-5x6	BL 714	U 4 Op	Tim 76730	2F	R 7.46	52.7	8x3	P
3	175A	7 1/2	8800	186	240	30000	11610	B10.50/24	B10.50/24	Has 175	6-5x6	BL 714	U 4 Op	Tim 76730	2F	R 7.48	38.7	8x3	P
4	Armleder	11Ha	1570	156	195	11500	4070	B7.00/20	B7.00/20	Con 16C	6-3 3/4 x 4 1/2	Fu WOB	U 4 No	Tim 76730	2F	H 5.83	31.2	6x3 1/4	C
5	21Ha	2 1/2-4	2185	146	213	15300	4783	B8.25/20	B8.25/20	Her WXB	6-3 3/4 x 4 1/2	Fu MLU	U 4 No	Tim 76730	2F	H 6.06	38.5	6x3 1/4	C
6	31Ha	3 1/2-5	2745	146	213	19500	5838	B9.00/20	B9.00/20	Her WXC	6-4x4 1/2	Fu MGU	U 4 No	Tim 76730	2F	R 6.02	39.2	7x3 1/4	C
7	41Ha	4-5 1/2	3050	160	227	23000	6600	B9.75/20	B9.75/20	Her WXC	6-4x4 1/2	Fu MGU	U 4 No	Tim 76730	2F	R 6.83	43.8	7x3 1/4	C
8	61Ha	5-7	3625	146	227	24000	7400	B9.75/20	B9.75/20	Her WXC2	6-4 1/2 x 4 1/2	Fu MGU	U 4 No	Tim 76730	2F	R 8.5	55.2	8 1/2 x 3 1/4	C
9	71Ha	7-9	4595	164	235	29500	7800	B10.50/20	B10.50/20	Her YXC	6-4 1/2 x 4 1/2	Fu VUOG	U 5 No	Tim 76730	2F	R 8.5	55.2	8 1/2 x 3 1/4	C
10	TRDA	10	3895	148	174	39000	6450	B9.75/20	B9.75/20	Her YXC3	6-4 1/2 x 4 1/2	Fu VUOG	U 5 No	Tim 76730	2F	R 7.8	56.1	8x3 1/4	C
11	Autocar	RG 2 1/2	3000	159	217	15000	3975	P34x7	DP34x7	Ow R	6-3 3/4 x 4 1/2	Ow T	U 4 No	Ow D	2F	R 8.57	52.6	9x3 1/4	C
12	DE 3 1/2	3 1/2	3500	150	192	15000	6100	P34x7	DP34x7	Ow SD	6-4x4 1/2	Ow T	U 4 No	Ow D	2F	H 6.21	39.3	8x3 1/4	C
13	DE 3 1/2	3 1/2	3850	150	210	15000	6675	B9.00/20	B9.00/20	Ow SD	6-4x4 1/2	Ow T	U 4 No	Ow TE	2F	H 6.43	40.7	8x3 1/4	C
14	DE 3 1/2	3 1/2	3950	150	192	15000	6865	B9.00/20	B9.00/20	Ow SD	6-4x4 1/2	Ow T	U 4 No	Ow TE	2F	H 6.43	40.7	8x3 1/4	C
15	DE 3 1/2	3 1/2	4150	150	174	15000	7250	P36x8	DP36x8	Ow SD	6-4x4 1/2	Ow T	U 4 No	Ow TE	2F	H 8.57	54.3	8x3 1/4	C
16	N 4	4	4600	191	227	25000	8090	B9.75/20	B9.75/20	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
17	NE 5	5	4725	149	170	16000	8350	B9.75/22	B9.75/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
18	NE 5	5	4800	191	227	25000	8350	B9.75/22	B9.75/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 5 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
19	NH 5	5	4925	149	170	16000	8440	B9.75/22	B9.75/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 5 No	Ow N	2F	H 8.57	50.1	8x3 1/4	C
20	S 5	5	5500	158	168	15000	8800	B9.75/22	B9.75/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 A 3	Ow CG	2F	R 8.52	54.0	9x3 1/4	C
21	SE 6	6	5800	158	168	15000	8950	B10.50/22	B10.50/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 A 3	Ow CG	2F	R 8.52	54.0	9x3 1/4	C
22	C 7 1/2	7 1/2	6600	158	176	15000	10950	B10.50/24	B10.50/24	Ow SCH	6-4 1/2 x 4 1/2	BL 734	U 4 A 3	Wis 78720	2F	H 9.92	121.1	10 1/2 x 3 1/4	C
23	CE 7 1/2	7 1/2	6000	172	203	16000	10300	S36x7	DS40x8	Ow SCH	6-4 1/2 x 4 1/2	BL 734	U 4 A 3	Wis 78720	2F	H 9.92	121.1	10 1/2 x 3 1/4	C
24	CBS 7 1/2	7 1/2	6200	203	203	16000	9800	P42x9	DP42x9	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 A 3	Ow CG	2F	H 8.57	52.6	9x3 1/4	C
25	CF 7 1/2	7 1/2	6900	164	182	15000	11280	B10.50/24	B10.50/24	Ow SCH	6-4 1/2 x 4 1/2	BL 734	U 4 A 3	Wis 78720	2F	H 9.92	121.1	10 1/2 x 3 1/4	C
26	CF 7 1/2	7 1/2	6000	192	242	16000	9975	B10.50/22	B10.50/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 A 3	Ow TG	2F	H 7.20	88.5	9x3 1/4	C
27	TE 8 1/2	8 1/2	6500	189	207	15000	10700	B10.50/24	B10.50/24	Ow SCH	6-4 1/2 x 4 1/2	BL 734	U 4 A 3	Ow TG	2F	H 7.20	87.6	10 1/2 x 3 1/4	C
28	TE 8 1/2	8 1/2	6800	195	247	16000	10950	B10.50/24	B10.50/24	Wau 6RB	6-5x5 1/2	BL 734	U 4 A 3	Ow TG	2F	H 7.20	87.6	10 1/2 x 3 1/4	C
29	(T) FE 20	20	9500	180	180	15000	12300	B10.50/24	B10.50/24	Ste LT	6-5 1/2 x 6	BL 734	U 4 A 3	Ow TG	2F	H 7.20	87.6	10 1/2 x 3 1/4	C
30	(Eng.und.seat) UD 3	3	3500	89	145	15000	6170	P34x7	DP34x7	Ow SD	6-4 x 4 1/2	Ow T	U 4 No	Ow H & D	2F	H 6.21	39.3	7x2 1/4	C
31	UN 4	4	4600	96	163	15000	9040	B9.75/20	B9.75/20	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
32	USE 6	6	5300	98	163	15000	9380	B9.75/22	B9.75/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
33	UTE 8 1/2	8 1/2	5600	98	163	15000	9510	B10.50/22	B10.50/22	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
34	W 8 1/2	8 1/2	6100	98	150	15000	10050	B10.50/24	B10.50/24	Ow SCH	6-4 1/2 x 4 1/2	Ow T	U 4 No	Ow N	2F	H 7.20	45.6	9x3 1/4	C
35	W 10	10	1350	168	182	11400	4000	B7.00/20	B7.00/20	Wau ZK	6-3 3/4 x 4 1/2	WG T9	U 4 No	Tim 53200	2F	H 6.6	42.2	10x2 1/2 x 1 1/2	C
36	W 200	2 1/2	1850	168	182	13400	4500	B7.50/20	B7.50/20	Wau TL	6-3 3/4 x 4 1/2	WG T9	U 4 No	Tim 53200	2F	H 6.6	42.2	10x2 1/2 x 1 1/2	C
37	W 300	3 1/2	2250	182	196	16300	5500	B8.25/20	B8.25/20	Wau 6-90	6-3 3/4 x 4 1/2	BL 234	U 4 No	Tim 56200	2F	R 7.4	47.4	12x2 1/2 x 1 1/2	C
38	W 300	3 1/2	2750	182	196	20700	7000	B9.00/20	B9.00/20	Wau 6-110	6-4x4 1/2	FU 5A-380	U 5 No	Tim 58205	2F	R 7.8	54.6	12x2 1/2 x 1 1/2	C
39	W 400	4	3750	Op	Op	25500	8200	B9.75/20	B9.75/20	Wau 6-125	6-4 1/2 x 5 1/2	BL 615	U 5 No	Tim 65720H	2F	R 8.5	55.6	12x2 1/2 x 1 1/2	C
40	Brookway	80C 1 1/2-2	1185	149	168	10500	4035	B6.50/20	B6.50/20	Con 26B	6-3 3/4 x 4	Wa T9	U 4 No	Tim 53200H	2F	H 5.66	36.2	5 1/2 x 2 1/2 x 1 1/2	C
41	90C 2-2 1/2	2 1/2	1485	149	168	12500	4480	B7.00/20	B7.00/20	Con 28B	6-3 3/4 x 4 1/2	Wa T9	U 4 No	Tim 53200H	2F	H 5.66	36.2	5 1/2 x 2 1/2 x 1 1/2	C
42	100C 2-3	2-3	1800	168	186	15000	4985	B7.50/20	B7.50/20	Con 30B	6-4 x 4 1/2	BL 314	U 5 No	Tim 54300H	2F	H 5.83	40.7	7 1/2 x 2 1/2 x 1 1/2	C
43	120C 2-3	2-3	2000	182	188	15000	5640	B7.50/20	B7.50/20	Con 30B	6-4 x 4 1/2	BL 314	U 4 No	Tim 54300H	2F	H 5.83	40.7	7 1/2 x 2 1/2 x 1 1/2	C
44	140C 2-3 1/2	2-3 1/2	2690	166	200	17500	6385	B8.25/20	B8.25/20	Con 30B	6-4 x 4 1/2	BL 314	U 4 Op	Wis 4916L	2F	R 6.66	43.5	5 1/2 x 3 1/4	C
45	150C 2-3 1/2	2-3 1/2	2540	188	200	18500	6000	B8.25/20	B8.25/20	Con E600	6-3 1/2 x 4 1/2	BL 334	U 4 Op	Tim 5620H	2F	R 5.71	35.0	8x3 1/4	C
46	141C 3-4	3-4	3175	170	212	19500	7450	B9.00/20	B9.00/20	Con 30B	6-4 x 4 1/2	BL 314	U 4 Op	Wis 7000H	2F	R 7.0	46.2	8x3 1/4	C
47	160C 3-4	3-4	3175	188	200	21000	7500	B9.00/20	B9.00/20	Con 32B	6-4 1/2 x 4 1/2	BL 534	U 5 Op	Tim 58200H	2F	R 6.14	48.5	8x3 1/4	C
48	170C 3-4	3-4	3450	170	212	19500	7700	B9.00/20	B9.00/20	Con 33B	6-4 1/2 x 4 1/2	BL 534	U 4 Op	Wis 7000H	2F	R 6.23	39.9	8x3 1/4	C
49	175C 3-4	3-4	3850	170	224	24000	7900	B9.00/20	B9.00/20	Con 34B	6-4 1/2 x 4 1/2	BL 534	U 5 Op	Tim 7000H	2F	R 6.23	39.9	8x3 1/4	C
50	195C 3-4	3-4	4200	170	224	24000	8540	B9.75/20	B9.75/20	Con 34B	6-4 1/2 x 4 1/2	BL 534	U 4 Op	Wis 1237H	2F	R 6.6			



FOR MEANING OF ABBREVIATIONS AND EXPLANATION OF REFERENCE MARKS SEE PAGE 50



Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS.										FRAME		
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE		Gear Ratios	Side Rail Dimensions	Type		
										Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speed	Make and Model	Location and Forward Speed				Gear and Type	Drive and Torque
1	Diamond T. 740	5-6	3750	178	232	22000	8800	B9.75/20	DB9.75/20	Her RXB	6-4 1/2 x 5 1/2	Co SA5	A5 Op	Wls 1237H	2F	R Opt	Opt 7 1/2 x 3 1/2	7 1/2 x 3 1/2	P	
2	(Concluded) 750	5-7	4560	178	232	28000	10000	B9.75/20	DB9.75/20	Her RXC	6-4 1/2 x 5 1/2	Co SA5	A5 Op	Wls 1737 KW	2F	R Opt	Opt 7 1/2 x 3 1/2	7 1/2 x 3 1/2	P	
3	750H	5-7	4050	178	232	28000	10000	B9.75/20	DB9.75/20	Her RXC	6-4 1/2 x 5 1/2	Co SA5	A5 Op	Wls 1737H	2F	R Opt	Opt 7 1/2 x 3 1/2	7 1/2 x 3 1/2	P	
4	1515	7 1/2	6600	171	Op	36000	12000	B10.50/24	DB10.50/24	Her HXB	6-5 x 6	BL 744	A 4 A 3	Wls 79730	2F	R Opt	Opt 9 1/2 x 3 1/2	9 1/2 x 3 1/2	P	
5	Differential E-131-2 1/2	2 1/2	3200	160	160	18100	5100	B9.00/20	DB9.00/20	Lyc ASD	6-3 1/2 x 4 1/2	BL 314	U 4 No	Tim 58200	BF	H 7.8	51.4	12x2 1/2 x 1 1/2	6190 1/2	P
6	Dodge Bros. HC	Com'l	3400	111	111		1775	B5.25/17	B5.25/17	Own	6-3 1/2 x 4 1/2	Own	U 3 No	Own	BF	H 4.37	12.2	5 1/2 x 2 1/2	7201 1/2	P
7	HCL	Com'l	365	119	119		1805	B5.25/17	B5.25/17	Own	6-3 1/2 x 4 1/2	Own	U 3 No	Own	BF	H 4.37	12.2	5 1/2 x 2 1/2	8196 1/2	P
8	UG-20	1 1/2	537	131	157	5900	2450	B7.50/17	B7.50/17	Own	6-3 1/2 x 4 1/2	Own	U 3 No	Own	BF	H 4.37	12.2	5 1/2 x 2 1/2	9201 1/2	P
9	G-20	1 1/2	597	131	157	5975	2520	B7.50/17	B7.50/17	Own	6-3 1/2 x 4 1/2	Own	U 4 No	Own	BF	H 5.85	36.1	7 1/2 x 2 1/2	10337 1/2	P
10	H-20	3 1/2	502	131	157	6075	2667	B7.00/20	DB7.00/20	Own	6-3 1/2 x 4 1/2	Own	U 4 No	Own	BF	H 5.86	37.5	6 1/2 x 2 1/2	1196 1/2	P
11	UG-30	1 1/2	525	131	157	8200	2490	B6.00/20	DB6.00/20	Own	6-3 1/2 x 4 1/2	Own	U 4 No	Own	BF	H 5.85	36.1	7 1/2 x 2 1/2	12201 1/2	P
12	G-30	1 1/2	585	131	157	8275	2560	B6.00/20	DB6.00/20	Own	6-3 1/2 x 4 1/2	Own	U 4 No	Own	BF	H 5.85	36.1	7 1/2 x 2 1/2	13201 1/2	P
13	(5a) H-30	1 1/2	490	131	157	8400	2612	B6.00/20	DB6.00/20	Own	6-3 1/2 x 4 1/2	Own	U 4 No	Own	BF	H 5.85	37.4	6 1/2 x 2 1/2	14208 1/2	P
14	F-35	2 1/2	1425	149	165	10175	3780	B6.00/20	DB6.00/20	Own	6-3 1/2 x 4 1/2	Own	U 4 No	Own	BF	H 6.38	41.4	7 1/2 x 2 1/2	15217 1/2	P
15	G-42	2 1/2	795	136	165	10500	3345	B7.00/20	DB7.00/20	Own	6-3 1/2 x 4 1/2	Own	U 5 No	Own	BF	H 6.37	50.9	8 1/2 x 2 1/2	17309 1/2	P
16	H-42	2 1/2	795	136	165	11000	3350	B7.00/20	DB7.00/20	Own	6-3 1/2 x 4 1/2	Own	U 5 No	Own	BF	H 6.37	46.0	8 1/2 x 2 1/2	18241 1/2	P
17	F-40	2 1/2	1995	150	190	16000	5173	B6.50/20	DB6.50/20	Own	6-3 1/2 x 5	Own	U 4 No	Own	BF	H 6.33	43.7	9 1/2 x 3 1/2	19309 1/2	P
18	(5) F-61	3 1/2	1515	135	185	12250	4235	P32x6	DP32x6	Own	6-3 1/2 x 5	Own	U 4 No	Own	BF	H 7.12	48.8	10x3 1/2 x 1 1/2	20384 1/2	P
19	(5) G-82	3 1/2	2575	170	195	20000	5789	P32x6	DP32x6	Own	6-3 1/2 x 5	Own	U 5 No	Own	BF	H 7.12	48.8	10x3 1/2 x 1 1/2	21384 1/2	P
20	Fageol 102	1 1/2	5350	195	220	25000	8040	B9.75/20	DB9.75/20	Own	6-3 1/2 x 5	Own	U 5 No	Own	BF	H 7.71	39.6	10 1/2 x 3 1/2	22224 1/2	P
21	106	1 1/2	102	112	122	11200	3825	B6.00/20	DB6.00/20	Wau ZK	6-3 1/2 x 4 1/2	WG T9	U 4 No	Tim 53200H	BF	H 5.66	36.2	5 1/2 x 3 1/2	23255 1/2	P
22	135	2 1/2	1600	161	173	11200	3975	B7.00/20	DB7.00/20	Wau TS	6-3 1/2 x 4 1/2	WG T9	U 4 No	Tim 53200H	BF	H 5.66	36.2	5 1/2 x 3 1/2	24255 1/2	P
23	250	2 1/2	1850	161	177	13400	5150	B7.50/20	DB7.00/20	Wau TL	6-3 1/2 x 4 1/2	WG T9	U 4 No	Tim 54200H	BF	H 5.83	37.3	5 1/2 x 3 1/2	25255 1/2	P
24	300	3 1/2	2450	178	196	16300	5750	B8.25/20	DB8.25/20	Wau MK	6-4 1/2 x 4 1/2	BL 314	U 4 No	Tim 56200H	BF	H 6.16	40.6	8x3 1/2 x 1 1/2	26255 1/2	P
25	370	5 1/2	3100	178	196	19500	6500	B9.00/20	DB9.00/20	Wau MK	6-4 1/2 x 4 1/2	BL 314	U 4 No	Tim 58200H	BF	H 6.83	45.1	8x3 1/2 x 1 1/2	27255 1/2	P
26	Federal DM	1 1/2	4600	182	200	25300	8080	B9.75/20	DB9.75/20	Wau SRK	6-4 1/2 x 5 1/2	BL 554	U 4 A 3	Tim 65706	WF	H 5.69	139.7	7 1/2 x 3 1/2	28255 1/2	P
27	15A	1 1/2	900	120	120	8000	3050	B6.00/20	DB6.00/20	Con W10	4-3 1/2 x 4 1/2	WG T9	U 4 No	Tim 53200H	BF	H 6.85	50.8	10x3 1/2 x 1 1/2	29255 1/2	P
28	20A	2 1/2	695	137	174	10000	3500	B6.50/20	DB6.50/20	Her JXC	6-3 1/2 x 4 1/2	WG T9	U 4 No	Tim 54200H	BF	H 6.80	43.5	8 1/2 x 2 1/2	30255 1/2	P
29	25A	2 1/2	1095	137	201	14000	4500	B7.00/20	DB7.00/20	Her JXC	6-3 1/2 x 4 1/2	WG T9	U 5 No	Tim 54200H	BF	H 6.80	43.5	8 1/2 x 2 1/2	31255 1/2	P
30	T3W	2 1/2	1595	148	185	14000	5110	P32x6	P36x8	Wau V	4-4 x 5	Own 7754	A 4 No	Tim 64603H	WF	H 7.25	36.3	6 1/2 x 3 1/2	32255 1/2	P
31	T3WFA	2 1/2	1795	148	185	16000	5400	P32x6	DP32x6	Wau V	4-4 x 5	Own 7754	A 4 No	Tim 65001H	WF	H 7.25	36.3	6 1/2 x 3 1/2	33255 1/2	P
32	A7	2 1/2	1945	175	237	15000	6050	B8.25/20	DB8.25/20	Wau GMS	6-3 1/2 x 4 1/2	CLa R100	A 5 No	Tim 6464	WF	H 6.43	45.5	10x3 1/2 x 1 1/2	34255 1/2	P
33	CU-6	3 1/2	4985	147	179	19000	8000	B10.50/20	B10.50/20	Wau SRS	6-4 1/2 x 5 1/2	Own U	U 4 No	Own U	BF	H 8.9	35.6	5 1/2 x 3 1/2	35255 1/2	P
34	ASDR	3 1/2	4685	147	179	19000	7800	B10.50/20	B10.50/20	Wau SRS	6-4 1/2 x 5 1/2	Own U	U 4 No	Own U	BF	H 8.9	35.6	5 1/2 x 3 1/2	36255 1/2	P
35	T10B	3 1/2	2420	175	237	18000	6500	B9.00/20	DB9.00/20	Wau GMS	6-3 1/2 x 4 1/2	CLa R900	A 5 No	Tim 75200H	2F	H 7.0	56.9	10x3 1/2 x 1 1/2	37255 1/2	P
36	T10DR-T10W	3 1/2	2550	165	230	19000	6645	P34x7	DP34x7	Con 18R	4-4 x 4 1/2	Own 7784	A 4 No	Tim 58200H	BF	H 6.83	44.1	7 1/2 x 3 1/2	38255 1/2	P
37	A600	2 1/2	1745	157	206	15000	5050	B7.50/20	DB7.50/20	Con L600	6-3 1/2 x 4 1/2	Own 7784	A 4 No	Tim 6160	BF	H 6.38	38.5	6x3 1/2 x 1 1/2	39255 1/2	P
38	A600T	3 1/2	2045	157	206	17000	6100	B8.25/20	DB8.25/20	Con L600	6-3 1/2 x 4 1/2	Own 7784	A 4 No	Tim 58000H	BF	H 7.8	50.8	6x3 1/2 x 1 1/2	40255 1/2	P
39	A600TDR	3 1/2	2180	157	206	17000	6100	B8.25/20	DB8.25/20	Con L600	6-3 1/2 x 4 1/2	Own 7784	A 4 No	Tim 58000H	BF	H 7.8	50.8	6x3 1/2 x 1 1/2	41255 1/2	P
40	U6-U6DR	4 1/2	3860	160	230	22000	7420	P36x8	DP36x8	Con 20R	6-4 1/2 x 4 1/2	CLa B 710	A 5 No	Tim 65706H	WF	H 7.50	44.1	7 1/2 x 3 1/2	42255 1/2	P
41	C7-C7W	6	4485	195	249	26000	9550	B9.75/20	DB9.75/20	Con 21R	6-4 1/2 x 4 1/2	CLa B 710	A 5 No	Tim 76275H	w/2F	H 7.92	51.5	7 1/2 x 3 1/2	43255 1/2	P
42	C8-C8W	6	4895	195	249	26000	9650	B9.75/20	DB9.75/20	Con 21R	6-4 1/2 x 4 1/2	CLa B 710	A 5 No	Tim 76275H	w/2F	H 7.92	51.5	7 1/2 x 3 1/2	44255 1/2	P
43	X8DR-X8W	7 1/2	4335	162	186	30000	9750	S36x6	S40x4	Con B7	4-5 x 6	CLa B 710	A 5 No	Tim 68700DP	w/2F	H 11.7	76.0	9 1/2 x 3 1/2	45255 1/2	P
44	X8DR-X8W	7 1/2	4735	162	186	30000	10475	P40x8	DP40x8	Con 21R	6-4 1/2 x 4 1/2	CLa B 710	A 5 No	Tim 68700DP	w/2F	H 11.7	76.0	9 1/2 x 3 1/2	46255 1/2	P
45	Ford Comm. Truck	1 1/2	320	112	112		1688	B5.50/17	B5.50/17	Own	4-3 1/2 x 4 1/2	Own	U 3 No	Own	BF	H 8.9	47.3	10x3 1/2 x 1 1/2	48200 1/2	P
46	Truck	1 1/2	320	112	112		2864	B6.00/20	P3											

JOURNAL



Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS										FRAME	
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE	TRANSMISSION	REAR AXLE		GEAR RATIOS	Drive and Torque	In High	In Low	Side Rail Dimensions	Type
												Make and Model	No. of Cylinders Bore and Stroke						
1	Indiana 95DR	2 1/2	1275	141	186	15000	4650	B7.50/20	DB7.50/20	Her JXC	6-3 1/2 x 4 1/2	BL 224	U4 Op	Wis 4916L	2F	H 6.66	41.2	7 1/2 x 2 1/2 x 3 1/2	T
2	(Concluded) 105	2 1/2	1775	156	186	16000	5600	B8.25/20	DB8.25/20	Her JXC	6-3 1/2 x 4 1/2	BL 234	U4 Op	Tim 56200H	SF	H 7.25	46.4	8 1/2 x 3 1/2 x 4 1/2	T
3	17A	3	2300	156	212	17000	6300	B8.25/20	DB8.25/20	Her WXC	6-4 1/2 x 4 1/2	BL 334	U4 A 3	Tim 58205H	SF	H 6.83	43.0	8 x 3 1/2 x 4 1/2	T
4	17DR	3	2675	170	224	19000	6700	B8.25/20	DB8.25/20	Her YXC	6-4 1/2 x 4 1/2	BL 334	U4 Op	Wis 70000	2F	R 6.28	38.6	8 1/2 x 3 1/2 x 4 1/2	T
5	19DR	3 1/2	3400	170	224	22000	7600	B9.00/20	DB9.00/20	Her YXC	6-4 1/2 x 4 1/2	BL 524	U4 Op	Wis 1237H	2F	R 7.2	52.3	8 1/2 x 3 1/2 x 4 1/2	T
6	43DR	4	4300	170	224	25000	8000	B9.75/20	DB9.75/20	Her RXB	6-4 1/2 x 4 1/2	BL 524	U4 Op	Wis 1627KH	2F	R 6.96	50.7	8 1/2 x 3 1/2 x 4 1/2	T
7	45DR	4 1/2	4800	170	224	25000	8700	B9.75/20	DB9.75/20	Her RXC	6-4 1/2 x 4 1/2	BL 534	U4 Op	Wis 1737H	2F	R 7.14	45.0	8 1/2 x 3 1/2 x 4 1/2	T
8	47DR	5	7000	188	224	28000	10500	B10.50/20	DB10.50/20	Cum 6H Die	6-4 1/2 x 5	BL 735	A5 No	Wis 1910W	2F	R 7.16	45.0	8 1/2 x 3 1/2 x 4 1/2	T
9	International (S) D1	1 1/2	360	113	113	4200	2180	B5.25/18	B5.25/18	Ow D	6-3 1/2 x 4 1/2	Ow D	U3 No	Ow D-55	SF	H 4.18	12.7	5 1/2 x 2 1/2 x 3 1/2	T
10	M2 1/2	1 1/2	850	118	118	7000	3180	B6.50/20	B6.50/20	Wau XAH	4-3 1/2 x 4 1/2	Ow H-4-A	U4 No	Ow H-7	SF	H 6.16	39.5	11 1/2 x 2 1/2 x 3 1/2	D
11	A2 1 1/2	1 1/2	615	136	160	8000	2945	B6.00/20	B6.00/20	Wau XAH	4-3 1/2 x 4 1/2	Ow H-4-A	U4 No	Ow H-7	SF	H 6.16	39.5	11 1/2 x 2 1/2 x 3 1/2	T
12	B2 1 1/2	1 1/2	615	136	160	8000	2945	B6.00/20	B6.00/20	Wau XAH	4-3 1/2 x 4 1/2	Ow H-4-A	U4 No	Ow H-7	SF	H 6.16	39.5	11 1/2 x 2 1/2 x 3 1/2	T
13	A3 1 1/2	1 1/2	795	136	160	10000	3572	P30x5	P32x6	Lye SAH	6-3 1/2 x 4 1/2	Ow H-4-A	U4 No	Ow H-7	SF	H 5.28	33.8	7 1/2 x 2 1/2 x 3 1/2	T
14	A3 1 1/2	1 1/2	970	136	160	10100	3600	B6.50/20	DB6.50/20	Lye SAH	6-3 1/2 x 4 1/2	Ow H-4-A	U4 No	Ow H-7	SF	H 5.28	33.8	7 1/2 x 2 1/2 x 3 1/2	T
15	AL3 1 1/2	1 1/2	895	138	164	10000	4032	B6.00/20	DB6.00/20	Lye 4SLH	6-3 1/2 x 4 1/2	Ow H-4-A	U4 No	Ow H-7	SF	H 6.50	42.9	8 1/2 x 2 1/2 x 4 1/2	T
16	B3 1 1/2	1 1/2	695	136	160	10000	3385	P30x5	P32x6	Ow FAB2	6-3 1/2 x 4	Ow H-4-A	U4 No	Ow H-7	SF	H 5.29	33.8	7 1/2 x 2 1/2 x 3 1/2	T
17	B4 1 1/2	1 1/2	1045	145	185	12750	4055	B6.50/20	DB6.50/20	Ow FAB-3	6-3 1/2 x 4	Ow H-4-A	U4 No	Ow H-7	SF	H 6.5	41.6	8 x 3 1/2 x 4 1/2	T
18	A4 2	2	1625	145	185	15750	5221	P32x6	DP32x6	Ow FBB	6-3 1/2 x 4 1/2	Ow H-5	U5 No	Ow H-7	SF	H 6.50	47.8	7 3/4 x 3 1/2 x 4 1/2	T
19	A5 3	3	2100	156	210	18750	5895	P34x7	DP34x7	Ow FBB	6-3 1/2 x 4 1/2	Ow H-5	U5 No	Ow H-7	SF	H 7.16	46.7	8 x 3 1/2 x 4 1/2	T
20	A6 3	3	2450	156	210	20850	6120	P34x7	DP34x7	Ow FBB	6-3 1/2 x 4 1/2	Ow H-5	U5 No	Ow H-7	SF	H 8.5	76.8	8 1/2 x 3 1/2 x 4 1/2	T
21	A7 3 1/2	3 1/2	3900	168	221	27800	8450	S36x5	S36x10	Ow FBB	6-3 1/2 x 4 1/2	Ow H-5	U5 No	Ow H-7	SF	H 8.5	76.8	8 1/2 x 3 1/2 x 4 1/2	T
22	W3 5	5	4850	160	235	28000	10125	S36x5	S40x12	Has 152	4-4 1/2 x 5 1/2	Ow H-6	U5 No	Ow H-7	SF	H 8.5	76.8	8 1/2 x 3 1/2 x 4 1/2	T
23	A7 1/2	3 1/2	4850	160	235	28000	10125	S36x5	S40x12	Ow FBB	6-3 1/2 x 4 1/2	Ow H-6	U5 No	Ow H-7	SF	H 8.5	76.8	8 1/2 x 3 1/2 x 4 1/2	T
24	A7 1/2	3 1/2	6300	160	235	37000	11590	B9.75/20	DB9.75/20	Ow FBB	6-5 1/2 x 5 1/2	Ow H-7	U5 No	Ow H-7	SF	H 8.5	76.8	8 1/2 x 3 1/2 x 4 1/2	T
25	Kenworth 88 1/2-2	2	1120	141	165	10100	3400	B7.00/20	B7.00/20	Her JXA	6-3 1/2 x 4 1/2	BL 214	U4	Cl B370	2F	H 5.4	34.6	5 1/2 x 3 1/2 x 4 1/2	T
26	88 1/2	2	1480	146	200	13400	4400	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 234	U4 Op	Tim 54300H	SF	H 5.83	37.4	8 x 3 1/2 x 4 1/2	T
27	101B 2-2 1/2	2 1/2	2050	144	186	13400	4700	B7.50/20	DB7.50/20	Bud H298	6-3 1/2 x 4 1/2	BL 234	U4	Tim 54300H	SF	H 5.83	37.4	8 x 3 1/2 x 4 1/2	T
28	89 2-2 1/2	2 1/2	2050	144	186	13400	4700	B7.50/20	DB7.50/20	Bud H298	6-3 1/2 x 4 1/2	BL 234	U4	Tim 54300H	SF	H 5.83	37.4	8 x 3 1/2 x 4 1/2	T
29	127 2-2 1/2-3	2 1/2	2600	154	202	16300	5490	B8.25/20	DB8.25/20	Her WXC	6-4 1/2 x 4 1/2	BL 334	U4 Op	Tim 56200H	SF	H 6.16	40.7	8 x 2 1/2 x 4 1/2	T
30	146B 3 1/2	3 1/2	3300	158	206	19500	5960	B9.00/20	DB9.00/20	Her YXC	6-4 1/2 x 4 1/2	BL 334	U4 Op	Tim 58205H	SF	H 6.83	43.4	8 x 3 1/2 x 4 1/2	T
31	166B 3 1/2	3 1/2	3300	158	206	19500	5960	B9.00/20	DB9.00/20	Bud K393	6-4 1/2 x 4 1/2	BL 334	U4 Op	Tim 58205H	SF	H 6.83	43.4	8 x 3 1/2 x 4 1/2	T
32	166A 3 1/2	3 1/2	3300	158	206	19500	5960	B9.00/20	DB9.00/20	Bud K393	6-4 1/2 x 4 1/2	BL 334	U4 Op	Tim 58205H	SF	H 6.83	43.4	8 x 3 1/2 x 4 1/2	T
33	166A 3 1/2	3 1/2	3300	158	206	19500	5960	B9.00/20	DB9.00/20	Has 147	6-4 1/2 x 4 1/2	BL 334	U4 Op	Tim 58205H	SF	H 6.83	43.4	8 x 3 1/2 x 4 1/2	T
34	180 4-5	4	4675	155	221	25600	7710	B9.75/20	DB9.75/20	Her YXC2	6-4 1/2 x 4 1/2	BL 1554	U4 A 3	Tim 75720H	2F	H 7.33	105.7	7 1/2 x 3 1/2 x 4 1/2	T
35	241 5-5	5	5450	169	221	27800	9000	B9.75/20	DB9.75/20	Her RXB	6-4 1/2 x 4 1/2	BL 714	U4 A 3	Tim 76720W	2F	H 7.33	85.5	8 x 3 1/2 x 4 1/2	T
36	241A 5-7	5	6500	169	228	27800	9500	B9.75/20	DB9.75/20	Has 160	6-4 1/2 x 5 1/2	BL 714	U4 A 3	Tim 76720W	2F	H 7.33	85.5	8 x 3 1/2 x 4 1/2	T
37	241B 5-7	5	6150	174	228	27800	9500	B9.75/20	DB9.75/20	Bud GL-6	6-4 1/2 x 4 1/2	BL 714	U4 A 3	Tim 76720W	2F	H 7.33	85.5	8 x 3 1/2 x 4 1/2	T
38	241C 5-7	5	7200	174	228	27800	10000	B9.75/20	DB9.75/20	Has 175	6-5 1/2 x 4 1/2	BL 714	U4 A 3	Tim 76720W	2F	H 7.33	85.5	8 x 3 1/2 x 4 1/2	T
39	Kleiber 80 1/2-2 1/2	2 1/2	1300	140	160	10000	3950	B6.50/20	DB6.50/20	Con 18E	6-3 1/2 x 4	BL 224	U4 No	Tim 53200H	BF	H 5.81	34.0	5 1/2 x 3 1/2 x 4 1/2	T
40	100 2 1/2	2 1/2	1750	170	180	12000	4400	B7.00/20	DB7.00/20	Con 20C	6-3 1/2 x 4 1/2	BL 324	U4 No	Tim 54200H	BF	H 6.6	38.7	7 1/2 x 3 1/2 x 4 1/2	T
41	120 2 1/2-4 1/2	2 1/2	2350	170	180	15000	5150	B7.50/20	DB7.50/20	Con E60U	6-3 1/2 x 4 1/2	BL 324	U4 No	Tim 56200H	BF	H 6.17	33.7	7 1/2 x 3 1/2 x 4 1/2	T
42	140 3-5 1/2	3 1/2	3300	180	190	18000	6500	B8.25/20	DB8.25/20	Con E60U	6-3 1/2 x 4 1/2	BL 324	U4 No	Tim 58200H	BF	R 7.1	38.7	7 1/2 x 3 1/2 x 4 1/2	T
43	160 4-6	4	4000	190	192	23400	7800	B9.75/20	DB9.75/20	Con 21R	6-4 1/2 x 4 1/2	BL 55	U5	Eat DR2412H	2F	R 7.25	42.0	7 1/2 x 3 1/2 x 4 1/2	T
44	KD67 6	6	6000	206	210	26000	9500	B9.75/20	DB9.75/20	Cum 6H Die	6-4 1/2 x 5	BL 714	U4 A 3	Eat 65041W	2F	R 8.5	91.0	8 x 3 1/2 x 4 1/2	C
45	La Fr. Republic D-2	2 1/2	1100	150	162	11000	3800	B6.00/20	DB6.00/20	Lye SA	6-3 1/2 x 4 1/2	Wa T9	U4 No	Tim 53200H	SF				



Line Number  
Piston Displacement  
Compression Ratio  
Torque lb. ft.  
N.A.C.C. Rated H.P.  
Max. Brake H.P. at  
R.P.M. Given  
Valve Arrangement  
Camshaft Material  
Piston Material  
Main Bearings  
Number and Diameter  
Length  
Oiling System Type  
Governor Make  
Carburetors Make  
Fuel Feed  
Ignition System Make  
Generator, Starter Make  
Clutch Type and Make  
Radiator Make  
Universal Make  
Make and Model  
Steering Gear Make  
Make, Location Type, Operation  
Lining Area  
Drum Material  
Hand Type, Location  
Cab to Rear of Frame  
Cab to Rear Axle  
Width of Frame  
Front  
Rear  
Auxiliary Type

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES			BODY MOUNT-ING DATA		SPRINGS																
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	R.P.M. Brake H.P. at R.P.M. Given	MAIN BEARINGS		Valve Arrangement	Camshaft Drive	Piston Material				Number and Diameter	Length	Oiling System Type	Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universal Make	Make and Model	Steering Gear Make	SERVICE		Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type
						Make	Location																				Lining Area	Drum Material							
1282	5.3	176	33.7	73-2800	L	G	A	7-2	10	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Tim	31020	Ros	L4IH	356	G	TX	92	56	34	37x2 1/2	54x2 1/2					
2282	5.3	176	33.7	73-2800	L	G	A	7-2	10	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Shu	5572	Ros	L4IH	383	G	TX	108	69	34	40x2 1/2	54x3					
3339	4.7	210	38.4	76-2400	L	L	G	A	7-2	10	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Shu	5572	Ros	L4IH	380	G	TX	108	69	34	39 1/2 x 2 1/2	54x3				
4288	4.4	283	45.9	94-2200	L	L	G	A	7-3	14	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Shu	5582	Ros	L4IH	398	G	CD	142	83	34	40x2 1/2	54x3				
5281	4.4	283	45.9	94-2200	L	L	G	A	7-3	14	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Shu	5582	Ros	L4IH	398	G	CD	142	83	34	40x2 1/2	54x3				
6501	4.9	330	48.6	110-2200	L	L	G	A	7-3	12	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Shu	5592B	Ros	L4IH	546	G	CD	142	83	34	40x2 1/2	54x3				
7529	4.9	330	48.6	110-2200	L	L	G	A	7-3	12	PC	Op	Str	M	AL	AL	P.B.L.	Yo	Spl	Shu	5592B	Ros	L4IH	546	G	CD	142	83	34	40x2 1/2	54x3				
8762	17	420	57.3	125-1800	H	L	G	A	7-3	17	CC	En	No	M	CI	LN	dpBL	Yo	Spl	Shu	1633W	Ros	W4IA	560	G	CD	144	90	34	40x3	54x3				
9213	5.0	133	26.3	66-3400	L	L	G	A	7-3	6	FP	No	Til	M	AL	AL	B-W	Mo	Spl	Own	D-50	Own	B4IM	156	P	21	54 1/2	29 1/2	Var	36 1/2 x 1 1/2	51 1/2 x 1 1/2				
10186	4.6	124	21.1	39-2400	L	L	G	A	7-3	6	FP	No	Zen	V	DR	DR	P.M.M.	Mo	MM	Own	104	Ros	B4IM	217	Pa	TX	66 1/2	35 1/2	32 1/2	40x2 1/2	46x2 1/2				
11186	4.6	124	21.1	39-2400	L	L	G	A	7-3	6	FP	No	Zen	V	DR	DR	P.M.M.	Mo	MM	Own	101	Ros	B4IM	212	P	21	93 1/2	53 1/2	32 1/2	40x2 1/2	46x2 1/2				
12186	4.6	124	21.1	39-2400	L	L	G	A	7-3	6	FP	No	Zen	V	DR	DR	P.M.M.	Mo	MM	Own	101	Ros	B4IM	212	P	21	93 1/2	53 1/2	32 1/2	40x2 1/2	46x2 1/2				
13244	4.7	138	25.3	54-2700	L	L	G	A	7-3	7	PC	No	Zen	M	DR	DR	P.Ro	Mo	MM	Own	200	Ros	B4IM	302	Pa	21	93 1/2	53 1/2	32 1/2	40x2 1/2	46x2 1/2				
14244	4.7	138	25.3	54-2700	L	L	G	A	7-3	7	PC	No	Zen	M	DR	DR	P.Ro	Mo	MM	Own	200	Ros	B4IM	302	Pa	21	93 1/2	53 1/2	32 1/2	40x2 1/2	46x2 1/2				
15244	4.7	138	25.3	54-2700	L	L	G	A	7-3	7	PC	No	Zen	M	DR	DR	P.Ro	Mo	MM	Own	200	Ros	B4IM	302	Pa	21	93 1/2	53 1/2	32 1/2	40x2 1/2	46x2 1/2				
16207	5.5	137	26.3	59-2900	H	L	G	A	7-3	6	FP	No	Til	M	DR	DR	P.Ro	Mo	MM	Own	108	Ros	B4IM	271	Pa	21	93 1/2	53 1/2	32 1/2	40x2 1/2	46x2 1/2				
17223	5.4	154	28.3	63-3200	H	L	G	A	7-3	6	FP	No	Til	M	DR	DR	P.Ro	Mo	MM	Own	108	Ros	B4IM	303	Pa	21	106 1/2	62 1/2	34	40x2 1/2	54x3				
18279	4.6	176	31.5	67-2600	H	L	G	A	7-3	13	FP	Ha	Zen	M	DR	DR	P.Ow	Mo	MM	Own	251	Ros	B4IM	378	Pa	21	104	61 1/2	34	42x3	54x3				
19279	4.6	176	31.5	67-2600	H	L	G	A	7-3	13	FP	Ha	Zen	M	DR	DR	P.Ow	Mo	MM	Own	300	Ros	B4IM	430	Pa	21	115	72 1/2	34	42x3	56x3				
20279	4.6	176	31.5	67-2600	H	L	G	A	7-3	13	FP	Ha	Zen	M	DR	DR	P.Ow	Mo	MM	Own	300	Ros	B4IM	430	Pa	21	115	72 1/2	34	42x3	56x3				
21212	4.9	200	38.4	69-1800	H	L	G	A	7-3	7	FP	HS	Zen	V	RB	DR	P.Ow	Ow	Ow	Own	400	Own	B4IM	710	Pa	21	106 1/2	73 1/2	34	41 1/2 x 3	56x3 1/2				
22300	3.8	240	36.1	69-1800	H	L	G	A	7-3	7	FP	HS	Zen	V	RB	DR	P.Ow	Ow	Ow	Own	500	Own	B4IM	794	Pa	21	120	81 1/2	34	44x3	58x4				
23225	4.5	315	48.6	98-1800	H	L	G	A	7-3	17	FP	Ha	Zen	M	DR	DR	P.Ro	Mo	MM	Own	503	Ros	B4IM	729	Pa	TD	106	72	34	48x3	56x3				
24248	4.4	398	60.0	114-1800	H	L	G	A	7-3	17	FP	Ha	Zen	M	DR	DR	P.Ro	Mo	MM	Own	503	Ros	B4IM	729	Pa	TD	106	72	34	48x3	56x3				
25228	4.7	150	27.3	50-2400	L	L	G	A	7-3	10	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Cia F208	Ros	L4IH	322	P	TX	108	60	31	38x2 1/2	52x3					
26282	4.7	176	31.5	73-2700	L	L	G	A	7-3	10	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 31000H	Ros	L4IH	335	A	TX	108	60	31	38x2 1/2	52x3					
27298	1.7	200	33.7	80-2800	L	L	G	A	7-3	9	CC	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 31000H	Ros	L4IH	335	A	FD	96	60	34	39x2 1/2	52x3					
28282	4.7	176	31.5	73-2700	L	L	G	A	7-2	10	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 31000H	Ros	L4IH	335	A	TX	108	60	31	38x2 1/2	52x2 1/2					
29339	4.4	212	38.4	76-2400	L	L	G	A	7-2	10	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 33000H	Ros	L4IH	335	A	FD	110	72	31	40x2 1/2	52x3					
30282	4.7	176	31.5	73-2700	L	L	G	A	7-2	10	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 31000H	Ros	L4IH	394	A	TX	108	60	31	38x2 1/2	52x3					
31393	4.9	260	42.1	103-2600	L	L	G	A	7-2	11	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 33000H	Ros	L4IH	394	A	FD	120	72	31	40x2 1/2	52x3					
32393	4.9	260	42.1	103-2600	L	L	G	A	7-2	11	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 35100H	Ros	L4IH	455	A	FD	120	72	33	42x3 1/2	56x3 1/2					
33377	4.9	258	38.4	98-2200	L	L	G	A	7-2	11	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 31000H	Ros	L4IH	455	A	FD	120	72	33	42x3 1/2	56x3 1/2					
34353	4.8	300	48.6	98-2200	L	L	G	A	7-3	14	CC	Ha	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 35100H	Ros	L4IH	602	A	FD	110	72	33	42x3 1/2	56x3 1/2					
35301	4.9	330	48.6	110-2200	L	L	G	A	7-3	14	CC	Ha	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 36020N	Ros	W2ImV	407	A	FD	132	84	33	42x3	56x4					
36368	4.4	322	43.3	125-2400	L	L	G	A	7-3	10	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 36020N	Ros	W2ImV	407	A	FD	132	84	33	42x3	56x4					
37372	4.4	335	48.6	114-1900	L	L	G	A	7-3	10	CC	Ha	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 36020N	Ros	W2ImV	407	A	FD	132	84	33	42x3	56x4					
38307	4.4	506	60.0	170-2000	H	L	G	A	7-3	11	FP	HS	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 36020N	Ros	W2ImV	407	A	FD	132	84	33	42x3	56x4					
39214	4.9	137	27.3	61-3000	L	L	G	A	7-2	11	FP	Ha	Zen	M	DR	DR	P.B.L	Pe	Spl	Tim 30000H	Ros	L4IH	335	G	TX	126	70 1/2	32	38x2 1/2	52x3 1/2					
40248	5.1	172	27.3	78-3100	L	L	G	A	7-2	10	FP	No	Str	V	DR	DR	D.B.L	Ow	Spl	Tim 31000H	Ros	L4IH	452	G	TX	126	76	34	38x2 1/2	52x2 1/2					
41288	4.6	182	32.6	73-2700	L	L	G	A	7-2	12	FP	No	Str	V	DR	DR	D.B.L	Ow	Spl	Tim 31000H	Ros	L4IH	354	G	FD	166	76	34	38x2 1/2	52x3					
42318	4.6	182	32.6	73-2700	L	L	G	A	7-2	12	FP	No	Str	V	DR	DR	D.B.L	Ow	Spl	Tim 33020H	Ros	L4IH	648	G	FD	172	104	34	38x2 1/2	52x3					
43247	4.2																																		

Line Number	MAKE AND MODEL	GENERAL (See Keynote)					TIRE SIZE		MAJOR UNITS					FRAME					
		Wheels Driven—6-Wheelers	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	TIRE SIZE		ENGINE		TRANSMISSION		REAR AXLE				
									Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torque	GEAR RATIOS In High In Low
1	Reo 3H(3J,3K)	2-5	1795	153	205	17500	5125	B7.50/20	DB7.50/20	Ow	6-3x5x5	Ow	U4	O2	Ow	SF	H 6.5 40.5 8x3x4	C	
2	(conc'd) 4H(4J,4M)	4-6	2595	170	205	20000	6280	B9.00/20	DB9.00/20	Ow	8-3x5x5	Ow	U4	O2	Ow	SF	H 6.5 40.5 10x3x4	C	
3	Schacht 10HA	2-3	1370	156	195	11500	4072	B7.00/20	DB7.00/20	Con 16C	6-3x4x4	BL 35	U4	No	Tim	BF	H 5.8 31.2 6x3x4	C	
4	15HA	2 1/2-3 1/2	1735	156	195	13000	4375	B8.25/20	DB8.25/20	Con 16C	6-3x4x4	BL 35	U4	No	Tim	BF	H 6.0 38.5 6x3x4	C	
5	20HA	2 1/2-4	2185	160	207	15300	4783	B8.25/20	DB8.25/20	Her WXC	6-4x4x4	Fu MLU	U4	No	Tim	BF	H 6.0 38.5 6x3x4	C	
6	25HA	3-4 1/2	2695	146	213	19500	5750	B9.00/20	DB9.00/20	Her WXC	6-4x4x4	Fu MGU	U4	No	Tim	BF	H 6.0 38.5 7x3x4	C	
7	28HA	4-5 1/2	3050	146	227	23000	6600	B9.75/20	DB9.75/20	Her WXC	6-4x4x4	Fu MGU	U4	No	Tim	BF	H 6.3 43.8 7x3x4	C	
8	30HA	5-7	3295	146	227	23000	6800	B9.75/20	DB9.75/20	Her WXC	6-4x4x4	Fu MGU	U4	No	Tim	BF	H 7.0 49.8 7x3x4	C	
9	35HA	5-7	3725	146	227	24000	7400	B9.75/20	DB9.75/20	Her WXC2C	6-4x4x4	Fu MGU	U4	No	Ow	2F	H 8.0 52.0 8x3x4	C	
10	40H	5-7	4295	154	235	25500	7600	B9.75/20	DB9.75/20	Her YXC	6-4x4x4	Fu VUOG	U5	No	Ow	2F	H 7.0 49.7 8x3x4	C	
11	40HB	7-9	4695	154	235	29500	7750	B10.50/20	DB10.50/20	Her YXC	6-4x4x4	Fu VUOG	U5	No	Wls	2F	H 7.0 49.7 8x3x4	C	
12	60HA	8-11	5895	152	247	35000	9820	B10.50/24	DB10.50/24	Her YXC	6-4x4x4	Fu VUOG	U5	No	Wls	2F	H 7.0 49.7 8x3x4	C	
13	(T) TRDA	10	3895	148	174	39000	6450	B9.75/20	DB9.75/20	Her YXC3	6-4x4x4	Fu VUOG	U5	No	Ow	2F	H 8.1 56.8 7x3x4	C	
14	STERLING	10	1135	142	162	11000	3450	B6.50/20	DB6.50/20	Con 25A	6-3x4x4	Wa T9	U4	No	Ow	BF	H 5.6 36.2 6x2x4	C	
15	FB50	2 1/2	1240	142	162	11500	3650	B7.00/20	DB7.00/20	Con 25A	6-3x4x4	Wa T9	U4	No	Ow	BF	H 5.6 36.2 6x2x4	C	
16	FB60	2 1/2-3	1590	142	162	14000	4150	B7.00/20	DB7.00/20	Wau TL	6-3x4x4	Wa T9	U4	No	Ow	BF	H 5.8 37.3 6x2x4	C	
17	FB70	2 1/2-3	2635	174	204	17000	5755	B7.50/20	B7.50/20	Wau ML	6-4x4x4	Ow UC7	U5	No	Ow	BF	H 7.4 52.7 10x3x4	L	
18	FB80	3-4	3065	174	204	21000	6680	B8.25/20	DB8.25/20	Wau ML	6-4x4x4	Ow UC7	U5	No	Ow	BF	H 7.8 55.3 10x3x4	L	
19	FB90	3-4	3610	174	204	24000	8200	B9.00/20	DB9.00/20	Wau ML	6-4x4x4	Ow UC7	U5	No	Ow	BF	H 8.1 55.6 10x3x4	L	
20	FC40	4	4105	174	204	22000	7480	B9.00/20	DB9.00/20	Wau 6MK	6-4x4x4	Ow UC7	U5	Op	Ow	CD	R 7.6 61.7 10x3x4	L	
21	FW97S, FD97S	4-5	4355	192	222	26000	8200	P36x8	DP36x8	Wau 6SRL	6-4x5x5	Ow UC2	U4	Op	Ow	w/2F	R 8.5 51.6 12x3x4	L	
22	FC100	5-5 1/2	4185	192	222	26000	7750	P36x8	DP36x8	Wau 6MK	6-4x5x5	Ow UC2	U4	Op	Ow	CD	R 9.3 61.2 12x3x4	L	
23	FW115, FD115	5-6	4690	192	222	32000	8750	P40x8	DP40x8	Wau 6SRL	6-4x5x5	Ow UC2	U4	Op	Ow	w/2F	R 8.2 54.6 12x3x4	L	
24	FC107	5-6	4700	192	222	27000	8200	P36x8	DP36x8	Wau 6SRL	6-4x5x5	Ow UC2	U4	Op	Ow	CD	R 8.2 54.6 12x3x4	L	
25	FW140, FD140	7-8	6005	192	222	35000	10050	P40x8	DP42x8	Wau SRL	6-4x5x5	Ow UC2	U4	Op	Ow	w/2F	R 10.0 66.6 15x3x4	L	
26	FC135	7-8	4800	192	222	35000	8900	P40x8	DP40x8	Wau SRL	6-4x5x5	Ow UC2	U4	Op	Ow	SF	R 9.3 62.2 15x3x4	L	
27	FC140	8-8 1/2	5595	200	230	36000	9350	P40x8	DP40x8	Wau HB	6-4x5x5	Ow UC2	U4	Op	Ow	CD	R 8.3 55.2 15x3x4	L	
28	FC145	8-8 1/2	6180	200	230	37000	10100	P40x8	DP40x8	Wau AB	6-4x5x5	Ow UC8	U4	Op	Ow	CD	R 9.4 58.9 15x3x4	L	
29	FW170, FD170	9-10	6980	200	230	35000	10550	P40x8	DP44x10	Wau AB	6-4x5x5	Ow UC8	U4	Op	Ow	w/2F	R 10.0 68.9 15x3x4	L	
30	FC170	9-10	6980	200	230	40000	10550	P40x8	DP42x8	Wau RB	6-5x5x5	Ow UC8	U4	Op	Ow	CD	R 9.4 58.9 15x3x4	L	
31	FD195	12-12 1/2	8925	200	230	39000	10750	B10.50/20	DB10.50/20	Cum H Die	6-4x5x5	BL 734	U4	Op	Wls 1910W	2F	H 8.8 55.8 15x3x4	L	
32	STEWART	4-5	670	124	124	8500	2875	B6.50/18	B6.50/18	Lyc	6-3x4x4	WG	U4	No	Cl	SF	H 5.4 35.1 6x2x4	T	
33	41XS	1 1/2	680	134	145	9000	2925	B6.50/18	B6.50/18	Lyc	6-3x4x4	WG	U4	No	Cl	SF	H 5.4 35.1 6x2x4	T	
34	44X	1 1/2	695	134	176	8500	3250	B6.50/20	B6.50/20	Lyc	6-3x4x4	WG	U4	No	Cl	SF	H 5.4 35.1 6x2x4	T	
35	42X	1 1/2	795	145	176	9000	3525	B6.50/20	B6.50/20	Lyc	6-3x4x4	WG	U4	No	Cl	SF	H 5.6 35.8 7x2x4	T	
36	43X	2	995	145	176	10800	4005	B6.50/20	B6.50/20	Lyc	6-3x4x4	WG	U4	No	Cl	SF	H 6.3 22.7 7x2x4	T	
37	45X	2	1295	145	190	12800	4350	B6.50/20	B6.50/20	Lyc	6-3x4x4	WG	U4	No	Cl	SF	H 6.3 22.7 7x2x4	T	
38	29XS	2 1/2	1695	145	220	15000	5190	B7.00/20	DB7.00/20	Lyc	6-3x4x4	BL	U5	No	Cl	SF	H 6.3 22.7 7x2x4	T	
39	32XS	2 1/2	1990	165	220	18000	5460	B7.00/20	DB7.00/20	Lyc	6-3x4x4	BL	U5	No	Cl	SF	H 6.3 22.7 7x2x4	T	
40	58-8	3 1/2	2190	170	226	18000	6025	B7.50/20	DB7.50/20	Lyc	8-3x4x4	Ful	U5	No	Cl	SF	H 6.3 22.7 7x2x4	T	
41	18X	3 1/2	2690	165	220	20000	6600	B7.50/20	DB7.50/20	Lyc	8-3x4x4	Ful	U5	No	Tim	WF	R 7.2 47.5 9x2x4	T	
42	48-8	3 1/2	2990	170	241	20000	6750	B8.25/20	DB8.25/20	Lyc	8-3x4x4	BL	U5	No	Cl	WF	R 7.1 50.1 9x2x4	T	
43	19X	3 1/2	3690	165	235	20000	7110	B9.00/20	DB9.00/20	Lyc	8-3x4x4	Ful	U5	A3	Tim	WF	R 7.2 51.2 9x2x4	T	
44	38-6	3 1/2-5	3990	170	241	23000	7600	B9.00/20	DB9.00/20	Lyc	8-3x4x4	Ful	U5	A3	Tim	WF	R 7.2 51.2 9x2x4	T	
45	38-8	3 1/2-5	3990	170	241	23000	7600	B9.00/20	DB9.00/20	Lyc	8-3x4x4	BL	U5	A3	Tim	WF	R 7.2 51.2 9x2x4	T	
46	27XS	7-8	6190	165	235	33000	10300	B10.50/24	DB10.50/24	Wau	6-4x5x5	BL	U4	A3	Tim	WF	R 10.1 93.8 9x2x4	T	
47	STUDEBAKER	(1)S-2 1/2	670	130	165	9000	3110	B6.00/20	P32x6	Ow	6-3x4x4	War T9	U4	No	Cl	SF	H 5.6 36.2 6x2x4	T	
48	S-4	2 1/2	785	130	165	10500	3445	B6.00/20	DB6.50/20	Ow	6-3x4x4	War T9	U4	No	Cl	SF	H 5.6 36.2 6x2x4	T	
49	S-4	2 1/2	945	141	165	12000	4095	B6.50/20	DB6.50/20	Ow	6-3x4x4	War T9	U4	No	Cl	SF	H 6.8 43.5 7x2x4	T	
50	S-4	2 1/2	1350	141	165	16000	4830	B6.50/20	DB6.50/20	Ow	6-3x4x4	War T9	U4	No	Cl	SF	H 6.8 43.5 7x2x4	T	
51	WARD LA FR.	25R14	2800	176	208	14000	6000	B7.50/20	DB7.50/20	Wau ML	6-4x4x4	BL 324	U4	No	Tim	SF	H 6.3 44.4 9x2x4	T	
52	25R16	3-4	2975	176	208	18000	6200	B8.25/20	DB8.25/20	Wau ML	6-4x4x4	BL 324	U4	No	Tim	SF	H 6.3 44.4 9x2x4	T</	



Line Number  
Type  
Piston Displacement  
Compression Ratio  
Torque lb. ft.  
N.A.C.C. Rated H.P.  
Max. Brake H.P. at R.P.M. Given  
Valve Arrangement  
Camshaft Drive  
Piston Material  
Number and Diameter  
Length  
Oiling System Type  
Governor Make  
Carburetors Make  
Fuel Feed  
Ignition System Make  
Generator, Starter Make  
Clutch Type and Make  
Radiator Make  
Universal Make  
Steering Gear Make  
Make, Location Type Operation  
Lining Area  
Drum Material  
Hand Type, Location  
Cab to Rear of Frame  
Cab to Rear Axle  
Width of Frame  
Front  
Rear  
Auxiliary Type

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES			BODY MOUNT-ING DATA			SPRINGS												
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	MAIN BEARINGS		Piston Material	Oiling System Type				Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	SERVICE		Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type
							Number and Diameter	Length																Make Location Type Operation	Lining Area							
1309	4.9	200	31.5	85-2800	L	C	A	7-2	12	CC	No	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IH	344	a	FD	124	68	34	44x3	54x3			
2358	4.9	230	36.4	110-2800	L	C	A	9-2	10	CC	No	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IHV	390	a	FD	143	83	34	44x3	56x3 1/2			
248	5.1	230	36.4	65-2600	L	C	A	7-2	10	CC	No	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IH	380	G	TX	129 1/2	Opt	31	40x2 1/2	50x3			
4348	5.1	150	27.3	65-2600	L	C	A	7-2	10	CC	No	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IH	452	G	TX	129 1/2	Opt	31	40x2 1/2	50x3			
539	4.7	225	38.4	73-2200	L	C	A	7-2	13	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IHV	452	G	TX	129 1/2	Opt	31	40x2 1/2	50x3			
739	4.7	225	38.4	73-2200	L	C	A	7-2	13	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IHV	578	G	TX	106	Opt	31	40x2 1/2	50x3			
839	4.7	225	38.4	73-2200	L	C	A	7-2	13	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Own	Ros	L4IHV	558	G	TX	106	Opt	31	40x2 1/2	50x3			
9360	4.7	238	40.3	80-2200	L	C	A	7-2	13	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Shu	Ros	L4IHV	768	H	TD	106	Opt	31	40x2 1/2	50x3			
1028	4.4	280	45.9	93-2200	L	C	A	7-2	15	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Shu	Ros	L4IHV	768	H	TD	106	Opt	31	40x2 1/2	50x3			
11428	4.4	280	45.9	93-2200	L	C	A	7-2	15	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Shu	Ros	L4IHV	893	G	TD	106	Opt	31	40x2 1/2	50x3			
1229	4.9	355	51.2	115-2200	L	C	A	7-2	15	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Shu	Own	W4A	847	G	TD	118	Opt	31	42x3	60x3 1/2			
13478	4.4	318	45.1	103-2200	L	C	A	7-2	15	PC	Mo	Str	M	DR	DR	P.B.L	Mc	Cle	Shu	Ros	L4IHV	893	H	TD	92 1/2	Opt	31	40x2 1/2	50x3			
15214	5.0	137	28.0	72-3300	L	C	A	4-2 1/2	8	CC	No	Zen	M	DR	DR	P.L.O	Pe	Spi	Tim	3000H	Ros	L4IH	269	P	TX	96	57	34	38x2 1/2	50x2 1/2		
16255	5.0	175	28.0	68-2600	L	C	A	4-2 1/2	7	CC	No	Zen	M	DR	DR	P.L.O	Pe	Spi	Tim	3100H	Ros	L4IH	282	P	TX	96	57	34	38x2 1/2	50x2 1/2		
17358	4.4	230	38.4	80-2500	L	C	A	7-2 1/2	12	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3100H	Ros	L4IHV	330	a	CX	144	91	34	42x2 1/2	54x3		
18358	4.4	230	38.4	80-2500	L	C	A	7-2 1/2	12	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3300H	Ha	L4IHV	396	a	CX	144	91	34	42x2 1/2	54x3		
19358	4.4	230	38.4	80-2500	L	C	A	7-2 1/2	12	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3300H	Ha	L4IHV	392	a	CX	144	91	34	42x2 1/2	54x3		
20381	4.4	240	40.8	85-2500	L	C	A	7-2 1/2	12	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3300H	Ha	O2IMV	466	a	JX	144	91	34	42x2 1/2	54x3		
21381	4.4	240	40.8	85-2500	L	C	A	7-2 1/2	12	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3300H	Ha	O2IMV	397	a	CX	144	91	34	42x2 1/2	54x3		
22462	4.5	300	45.9	102-2400	L	C	A	7-3	13	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3500H	Ros	L4IHV	664	a	CX	172	108	34	48x3	54x3		
23381	4.4	240	40.8	85-2500	L	C	A	7-2 1/2	12	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3500H	Ros	O2IMV	576	a	JX	172	108	34	48x3	54x3		
24462	4.5	300	45.9	102-2400	L	C	A	7-3	13	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3500H	Ros	L4IHV	664	a	CX	172	108	34	48x3	54x3		
25462	4.5	300	45.9	102-2400	L	C	A	7-3	13	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	3500N	Ros	O2IMV	576	a	JX	172	108	34	48x3	54x3		
26462	4.5	300	45.9	102-2400	L	C	A	7-3	13	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	26450TN	Ros	W4A	690	a	CX	172	108	34	48x3	54x3		
27462	4.5	300	45.9	102-2400	L	C	A	7-3	13	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	26450N	Ros	L4IHV	708	a	JX	172	108	34	48x3	54x3		
28489	4.5	295	43.4	90-2000	L	C	A	4-3 1/2	11	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	26450N	Ros	O2IMV	666	a	JX	168	107	34	48x3	54x3		
29489	4.5	330	48.6	99-2000	L	C	A	4-3 1/2	11	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	26450N	Ros	O2IMV	666	a	JX	168	107	34	48x3	54x3		
30489	4.5	330	48.6	99-2000	L	C	A	4-3 1/2	11	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	27050TW	Ros	W4A	690	a	CX	163	107	34	48x3	60x4		
31677	4.4	440	60.0	125-2000	L	C	A	4-3 1/2	11	CC	Ha	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	27450N	Ros	O2IMV	666	a	JX	168	107	34	48x3	54x3		
32672	17.6	420	57.0	125-1800	H	C	A	7-3 1/2	16	CC	En	No	M	CI	LN	P.B.L	Mc	Cle	Tim	27450TW	Ros	W4A	718	a	CX	163	107	34	48x3	60x4		
33672	17.6	420	57.0	125-1800	H	C	A	7-3 1/2	16	CC	En	No	M	CI	LN	P.B.L	Mc	Cle	Spi	Ros	B4IM	180	a	CX	92	51	32	38x2 1/2	50x2 1/2			
34207	4.8	142	25.3	62-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	226	a	TX	92	51	32	38x2 1/2	50x2 1/2			
35224	4.8	142	25.3	62-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	226	a	TX	92	51	32	38x2 1/2	50x2 1/2			
36242	4.8	142	25.3	62-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	317	a	TX	92	51	32	38x2 1/2	50x2 1/2			
37242	5.1	162	27.3	65-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	317	a	TX	103 1/2	62	32	38x2 1/2	50x2 1/2			
38242	5.1	162	27.3	65-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	349	a	TX	104 1/2	58	32	38x2 1/2	50x3			
39242	5.1	162	27.3	65-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	524	a	TX	104 1/2	58	32	38x2 1/2	50x3			
40242	5.1	162	27.3	65-2800	L	C	A	4-2 1/2	8	CC	No	Zen	P	DR	DR	P.B.B	Fe	Spi	Spi	Ros	B4IM	594	a	TX	129 1/2	79	32	38x2 1/2	50x3			
41322	4.6	224	36.2	90-2750	L	C	A	4-2 1/2	10	FP	Mo	Str	P	DR	DR	P.Fu	Fe	Spi	Cla	Ros	B4IM	670	a	TF	126 1/2	79	32	40x3	50x3			
42354	5.2	225	36.4	90-2750	L	C	A	4-2 1/2	10	FP	Mo	Str	P	DR	DR	P.Fu	Fe	Spi	Cla	Ros	B4IMV	594	a	TF	128 1/2	75	32	40x3	56x3			
43420	5.2	300	44.4	130-2800	L	C	A	5-2 1/2	12	FP	Mo	Str	P	DR	DR	P.B.L	Fe	Spi	Cla	Ros	B4IMV	670	a	TX	126 1/2	75	32	40x3	56x3			
44354	4.6	224	36.2	90-2750	L	C	A	4-2 1/2	10	FP	Mo	Str	P	DR	DR	P.Fu	Fe	Spi	Eat	Ros	B4IM	670	a	TX	126 1/2	75	32	40x3	56x3			
45462	4.6	224	36.2	90-2750	L	C	A	4-2 1/2	10	FP	Mo	Str	P	DR	DR	P.Fu	Fe	Spi	Eat	Ros	B4IMV	670	a	TX	126 1/2	75	32	40x3	56x3			
46420	5.2	300	44.4	130-2800	L	C	A	5-2 1/2	12	FP	Mo	Str	P	DR	DR	P.B.L	Fe	Spi	Eat	Ros	B4IMV	670	a	TX	126 1/2	75	32	40x3	56x3			
47416	4.6	224	36.2	90-2750	L	C	A	4-2 1/2	10	FP	Mo	Str	P	DR	DR	P.Fu	Fe	Spi	Eat	Ros	W4A	902	a	TX	128 1/2	73	34	40x3	56x4			
48354	4.6	224	36.2	90-2750	L	C	A	4-2 1/2	10	FP	Mo	Str	P	DR	DR	P.Fu	Fe	Spi	Eat	Ros	W4A	902	a	TX	128 1/2	73	34	40x3	56x4			
49230	4.6	154	25.4	75-3200	L	C	A	4-2 1/2	8	CC	Ha	Str	M	DR	DR	P.L.O	Mc	Cle	Cla	F212	Ros	B4IM	231	a	41	83	48	33H	36x1 1/2	45x2 1/2	O	
50230	4.6	154	25.4	75-3200	L	C	A	4-2 1/2	8	CC	Ha	Str	M	DR	DR	P.L.O	Mc	Cle	Cla	F212	Ros	B4IMV	231	a	41	83	48	33H	36x1 1/2	45x2 1/2		
51230	4.6	154	25.4	75-3200	L	C	A	4-2 1/2	8	CC	Ha	Str	M	DR	DR	P.L.O	Mc	Cle	Tim	31010	Ros	B4IMV	284	D	41	97	60	34	39x2	56x3		
52230	4.6	154	25.4	75-3200	L	C	A	4-2 1/2	8	CC	Ha	Str	M	DR	DR	P.L.O	Mc	Cle	Tim	31020	Ros	B4IMV	420	a	41	97	60	34	39x2 1/2	56x3		
53358	4.6	228	38.4	77-2200	L	C	A	7-2 1/2	12	FP	Mo	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim	3300H	Ros	L4IHV	260	a	TX	144	90	33	40x2 1/2	52x3		
54358	4.6	228	38.4	77-2200	L	C	A	7-2 1/2	12	FP	Mo	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim	3300H	Ros	L4IHV	330	a	TX	144	90	33	40x2 1/2	52x3		
55381	4.6	24																														



Line Number	MAKE AND MODEL	Wheels Driven—6-Wheelers	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS							FRAME				
			Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE			Type		
											Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type		Drive and Torque	Gear Ratios In High In Low
1	(6) Gen. Mo. T90	4R	5-7 1/2	4690	185	220	28000	9570	B7.50/20	DB7.50/20	Ow 400	6-4 1/2 x 5	Ow 400	U 5 Op	Ow 400	WF	R 9.25	76.0	9 1/2 x 3 1/2 x 1 1/2	TL
2	.....T95	4R	9-11	7695	189	224	40000	13250	P34x7	DP34x7	Ow 525	6-4 1/2 x 5 1/2	Ow 525	U 4 Op	Ow 525	WF	R 8.50	53.3	9 1/2 x 4 1/2 x 1 1/2	TL
3	.....T130	4R	12-15	9490	189	224	50000	14545	B9.75/20	DB9.75/20	Ow 616	6-4 1/2 x 5 1/2	Ow 616	U 4 A 3	Ow 616	WF	R 9.50	119.0	9 1/2 x 4 1/2 x 1 1/2	TL
4	Ind. 958BT-151	2C	3	1875	168	186	20000	6125	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4 No	Tim SBT151	WF	T 7.4	45.8	7 1/2 x 2 1/2 x 1 1/2	TL
5	.....958W 75	4R	3	1900	168	186	20000	5800	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4 No	Tim SW75	WF	T 7.4	45.8	7 1/2 x 2 1/2 x 1 1/2	TL
6	.....178BT251	2C	4	3500	188	224	28000	8850	P34x7	DP34x7	Her YXC	6-4 1/2 x 4 1/2	BL 524	U 4 Op	Tim SBT251	WF	T 6.2	38.1	8 1/2 x 3 1/2 x 1 1/2	TL
7	.....178W251	4R	4	3900	188	224	28000	9500	P34x7	DP34x7	Her YXC	6-4 1/2 x 4 1/2	BL 524	U 4 Op	Tim SW251	WF	T 6.2	38.1	8 1/2 x 3 1/2 x 1 1/2	TL
8	.....12X4	4R	1 1/2	2650	141	10000	4350	B6.50/20	DB6.50/20	Her JXC	6-3 1/2 x 4 1/2	BL	U 4 A 2	W 15	2F	SF	H 5.14	54.0	7 1/2 x 2 1/2 x 1 1/2	TL
9	.....14X4	4R	2 1/2	3950	141	14000	5900	B7.50/20	DB7.50/20	Her WXB	6-3 1/2 x 4 1/2	BL	U 4 U 2	W 15	2F	SF	H 5.40	50.0	7 1/2 x 2 1/2 x 1 1/2	TL
10	.....16X4	4R	3	4850	156	16000	7500	B8.25/20	DB8.25/20	Her WXC2	6-4 1/2 x 4 1/2	BL	U 4 U 2	W 15	2F	SF	H 6.06	89.0	8 1/2 x 3 1/2 x 1 1/2	TL
11	.....16X6	6	3	5650	170	20000	8000	B7.00/20	DB7.00/20	Her RXB	6-4 1/2 x 4 1/2	BL	U 4 U 2	W 15	2F	SF	H 6.06	89.0	8 1/2 x 3 1/2 x 1 1/2	TL
12	.....18X4	4R	3 1/2	5850	160	21000	9000	B9.00/20	DB9.00/20	Her YXC	6-4 1/2 x 4 1/2	BL	U 4 A 2	W 15	2F	SF	H 7.83	110.0	8 1/2 x 3 1/2 x 1 1/2	TL
13	.....18X6	6	3 1/2	6650	170	28000	10500	B8.25/20	DB8.25/20	Her RXC	6-4 1/2 x 5 1/2	BL	U 4 A 2	W 15	2F	SF	H 7.83	110.0	8 1/2 x 3 1/2 x 1 1/2	TL
14	.....20X4	4R	4 1/2	7200	188	24000	10600	B9.75/20	DB9.75/20	Her HXB	6-5 1/2 x 6	BL	U 4 A 2	W 15	2F	SF	H 8.00	128.0	9 1/2 x 3 1/2 x 1 1/2	TL
15	.....20X6	6	4 1/2	8950	188	36000	14000	B9.00/20	DB9.00/20	Her HXC	6-5 1/2 x 6	BL	U 4 A 2	W 15	2F	SF	H 8.95	84.0	9 1/2 x 3 1/2 x 1 1/2	TL
16	.....22X4	4R	5	10000	200	31000	14000	B10.50/20	DB10.50/20	Her HXC	6-5 1/2 x 6	BL	U 4 A 2	W 15	2F	SF	H 9.11	86.0	8 1/2 x 3 1/2 x 1 1/2	TL
17	.....22X6	6	5	12100	200	40000	16000	B9.75/20	DB9.75/20	Her HXD	6-5 1/2 x 6	BL	U 4 A 2	W 15	2F	SF	H 9.11	86.0	8 1/2 x 3 1/2 x 1 1/2	TL
18	Kenworth 898BT	7	7	2380	188	224	25500	7350	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 234	U 4 Op	Tim SBT151	WF	A 7.4	45.5	8 1/2 x 3 1/2 x 1 1/2	TL
19	.....127SBT	7	7	3450	188	224	26000	8000	B8.25/20	DB8.25/20	Her WXC2	6-4 1/2 x 4 1/2	BL 334	U 4 Op	Tim SBT151	WF	A 7.4	45.5	8 1/2 x 3 1/2 x 1 1/2	TL
20	.....146SBT	7	7	4250	188	224	33000	9000	B9.00/20	DB9.00/20	Bud K393	6-4 1/2 x 4 1/2	BL 334	U 4 Op	Tim SBT251	WF	A 7.8	48.0	8 1/2 x 3 1/2 x 1 1/2	TL
21	.....186SDT	2C	10	6450	205	235	38000	10500	B9.00/20	DB9.00/20	Her YXC2	6-4 1/2 x 4 1/2	BL 1554	U 4 A 3	Tim Sdt310W	WF	H 7.33	104.0	9 1/2 x 3 1/2 x 1 1/2	TL
22	.....241SDT	2C	10	6850	205	235	40500	11000	B9.00/20	DB9.00/20	Her RXB	6-4 1/2 x 5 1/2	BL 714	U 4 A 3	Tim Sdt310W	WF	H 7.33	85.5	9 1/2 x 3 1/2 x 1 1/2	TL
23	.....346A	4R	10	8800	210	240	40500	13000	B9.75/20	DB9.75/20	Has 160	6-4 1/2 x 5 1/2	BL 714	U 4 A 3	Tim SW310W	WF	H 7.25	84.5	9 1/2 x 3 1/2 x 1 1/2	TL
24	.....346B	4R	10	8550	210	240	40500	13000	B9.75/20	DB9.75/20	Bud GF-6	6-4 1/2 x 5 1/2	BL 714	U 4 A 3	Tim SW310W	WF	H 7.25	98.4	8 1/2 x 3 1/2 x 1 1/2	TL
25	.....346C	4R	10	9500	210	240	40500	14000	B9.75/20	DB9.75/20	Has 175	6-5 1/2 x 6	BL 714	U 4 A 3	Tim SW310W	WF	H 7.25	98.4	8 1/2 x 3 1/2 x 1 1/2	TL
26	.....386C	4R	10	10200	210	240	50100	14500	B9.75/20	DB9.75/20	Has 175	6-5 1/2 x 6	BL 714	U 4 A 3	Tim SW410W	WF	H 7.60	103.0	8 1/2 x 3 1/2 x 1 1/2	TL
27	La Fran-R. Q6	4R	9-12	4475	187	199	25500	8500	B8.25/20	DB8.25/20	Ow 312B	12-4x5	BL 714	U 4 No	Tim SWD410W	WF	Opt	Opt	12x3 1/2 x 1 1/2	TL
28	Le Moon (9) 701	4R	5-6	4475	187	199	25500	8500	B8.25/20	DB8.25/20	Lyc AEC	8-3 1/2 x 4 1/2	Fu VUOG	U 5 No	TL 63703-97H	WF	R 6.20	43.8	7 1/2 x 4 1/2 x 1 1/2	TL
29	.....801	4R	6-7	5100	187	199	32500	9720	B9.00/20	DB9.00/20	Lyc AEC	8-3 1/2 x 4 1/2	Fu VUOG	U 5 No	TL 65703-97H	WF	R 6.75	47.7	7 1/2 x 4 1/2 x 1 1/2	TL
30	.....802	4R	6-7	5350	187	199	32500	9800	B9.00/20	DB9.00/20	Wau 68RL	6-4 1/2 x 5 1/2	Fu VUOG	U 5 No	TL 65703-97H	WF	H 6.75	47.7	7 1/2 x 4 1/2 x 1 1/2	TL
31	.....900	4R	7-8	6775	191	203	36000	12000	B9.75/20	DB9.75/20	Wau 68RL	6-4 1/2 x 5 1/2	BL 607	U 7 No	Tim SW310W	WF	H 9.25	86.9	9 1/2 x 4 1/2 x 1 1/2	TL
32	.....1000	4R	8-10	7950	196	208	40000	12600	B9.75/24	DB9.75/24	Wau 6AB	6-4 1/2 x 5 1/2	BL 714	U 4	3 Tim SW310W	WF	H 9.25	128.0	9 1/2 x 4 1/2 x 1 1/2	TL
33	.....1200	4R	10-12	8500	196	208	40000	14000	B9.75/24	DB9.75/24	Wau 6RB	6-5 1/2 x 6	BL 714	U 4	3 Tim SW410W	WF	H 9.25	128.0	9 1/2 x 4 1/2 x 1 1/2	TL
34	.....1200D	4R	10-12	9750	196	208	40000	14000	B9.75/24	DB9.75/24	Cum.Die.H6	6-4 1/2 x 5 1/2	BL 735	U 5 No	Tim SW410W	WF	H 7.6	47.6	9 1/2 x 4 1/2 x 1 1/2	TL
35	Mack BX	4R	8-15	8150	178	207	37070	12000	B8.25/22	DB8.25/22	Ow 22B	6-4 1/2 x 5 1/2	Ow 22B	U 4 No	Ow 22B	WF	A 6.53	46.0	9 1/2 x 3 1/2 x 1 1/2	TL
36	.....BQ	4R	8-15	9350	224	248	35000	15000	B9.75/22	DB9.75/22	Ow 22B	6-4 1/2 x 5 1/2	Ow 22B	U 4 No	Ow 22B	WF	R 6.54	41.9	10 1/2 x 3 1/2 x 1 1/2	TL
37	.....AC	4R	8-15	8500	217	257	35000	14500	P40x8	DP40x8	Ow 22B	6-4 1/2 x 5 1/2	Ow 22B	U 4 No	Ow 22B	WF	R 9.26	59.4	8 1/2 x 3 1/2 x 1 1/2	TL
38	.....AK	4R	8-15	9000	217	257	35000	15900	B9.75/22	DB9.75/22	Ow 22B	6-4 1/2 x 5 1/2	Ow 22B	U 4 No	Ow 22B	WF	R 9.26	59.4	8 1/2 x 3 1/2 x 1 1/2	TL
39	.....AP	4R	8-15	10500	217	257	35000	14850	P40x8	DP40x8	Ow 22B	6-4 1/2 x 5 1/2	Ow 22B	U 4 No	Ow 22B	WF	R 9.26	59.4	8 1/2 x 3 1/2 x 1 1/2	TL
40	.....AP	4R	8-15	11000	217	257	35000	16400	B9.75/22	DB9.75/22	Ow 22B	6-5 1/2 x 6	Ow 22B	U 4 No	Ow 22B	WF	R 9.26	59.4	8 1/2 x 3 1/2 x 1 1/2	TL
41	Mar-Her TH310A-6	10	10000	193	229	37070	14070	B9.75/22	DB9.75/22	Her RXC	6-4 1/2 x 5 1/2	Fu 5A530	U 5 A 2	Ow 22B	WF	R 9.11	163.0	8 1/2 x 3 1/2 x 1 1/2	TL	
42	.....(13) TH315	6	12	12500	198	234	42420	15420	B9.75/22	DB9.75/22	Her HXB	6-5 1/2 x 6	BL 724	U 4 A 3	Ow 22B	WF	R 9.11	163.0	8 1/2 x 3 1/2 x 1 1/2	TL
43	.....(13) TH320	6	15	15000	225	255	51900	18900	B10.50/24	DB10.50/24	Her HXC	6-5 1/2 x 6	BL 724	U 4 A 3	Ow 22B	WF	R 9.11	163.0	8 1/2 x 3 1/2 x 1 1/2	TL
44	.....(13) TH330	6	20	17500	225	255	64100	20100	B12.75/20	DB12.75/20	Her HXD	6-5 1/2 x 6	BL 734	U 4 A 3	Ow 22B	WF	R 9.11	163.0	8 1/2 x 3 1/2 x 1 1/2	TL
45	Moreland RA15	10	1550	153	Op	20000	5300	B6.50/20	DB6.50/20	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4 No	Tim SBT75	WF	SF	R 5.66	35.0	7 1/2 x 2 1/2 x 1 1/2	TL
46	.....RA20	10	1981	149	Op	20000	6100	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4 No	Tim SBT151	WF	SF	R 6.17	38.0	7 1/2 x 2 1/2 x 1 1/2	TL
47	.....BD21M	10	3534	184	Op	21000	8300	B7.50/20	DB7.50/20	Her WXC	6-4 1/2 x 4 1/2	BL 334	U 4	Tim 64800	WF	W	R 6.40	39.0	6 1/2 x 3 1/2 x 1 1/2	TL
48	.....ED25M	10	4067	184	Op	25000	8900	B8.25/20	DB8.25/20	Her WXC3	6-4 1/2 x 4 1/2	BL 334	U 4	Tim 65000	WF	W	R 7.50	46.0	9 1/2 x 3 1/2 x 1 1/2	TL
49	.....HD34M	10	5869	220	Op	34000	11000	B9.00/20	DB9.00/20	Her RXC	6-4 1/2 x 4 1/2	BL 524	U 4	Tim 65720	WF	W	R 8.50	62.0	9 1/2 x 3 1/2 x 1 1/2	TL
50	.....FDT152	2R	8 1/2	4580	174	204														

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC. TRICAL	FRONT AXLE	BRAKES		BODY MOUNTING DATA			SPRINGS		Auxiliary Type										
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	Piston Material	MAIN BEARINGS	Oiling System Type				Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make		Universals Make	Steering Gear Make	SERVICE		Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear
																								Make, Location, Operation	Lining Area						
1400	4.6	296	40.9	110-2300	H	G	A	7-2 1/2	8 1/4	FP	Ha	Str	M	DR	DR	dp. Ow	Lo	Cle	Ow	Jac	B41A	557	a	TX	161	100 1/4	34 1/2	40x3	50x4	N	
2525	4.5	380	48.6	128-2100	H	G	A	7-2 1/2	14 1/4	FP	Ha	Str	M	DR	DR	dp. Ow	Lo	Spl	Ow	Jac	B61A	917	a	TX	161	100	34 1/2	50x3 1/2	45x4	N	
3616	4.5	450	57.0	149-3100	H	G	A	7-2 1/2	10 1/4	FP	Ha	Str	M	DR	DR	dp. Ow	Lo	Spl	Ow	Jac	B61A	965	a	TX	161	100	34 1/2	50x3 1/2	45x4	N	
2825	5.3	186	33.7	73-2800	L	G	A	7-2 1/2	10 1/4	PC	No	Str	M	AL	AL	P. BL	Yo	Spl	Tim	31020	Ros	L61HV	559	G	TX	140	83	34	37x2 1/2	52x4	N
5282	5.3	186	33.7	73-2800	L	G	A	7-2 1/2	10 1/4	PC	No	Str	M	AL	AL	P. BL	Yo	Spl	Tim	31020	Ros	L61HV	459	G	TX	140	83	34	37x2 1/2	44x3	N
6428	4.4	283	45.9	94-2200	L	G	A	7-3	14	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Shu	5582B	Ros	L61HV	625	G	CD	168	101	34 1/2	40x2 1/2	52x4	N
7282	4.4	283	45.9	94-2200	L	G	A	7-3	14	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Shu	5582B	Ros	L61HV	625	G	CD	168	101	34 1/2	40x2 1/2	52x4	N
8282	5.4	176	33.8	73-2800	L	G	A	7-2 1/2	10 1/4	PC	Opt	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L41H	...	G	CD	92	56	34	37x2 1/2	54x2 1/2	N
9298	4.7	235	38.4	70-2600	L	G	A	7-2 1/2	13 1/4	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L41H	...	G	CD	92	56	34	37x2 1/2	54x2 1/2	N
10361	4.7	235	38.4	82-2400	L	G	A	7-2 1/2	13 1/4	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L41HV	...	G	CD	108	73 1/4	34	39 1/2 x 2 1/2	54x3	N
11501	5.0	330	48.6	110-2200	L	G	A	7-3	12 1/4	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L61HV	...	G	CD	142	87 1/4	34	39 1/2 x 2 1/2	54x3	N
12428	4.5	283	45.9	94-2200	L	G	A	7-3	14	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L41HV	...	G	CD	120	72	34	44x3	50x4	N
13529	4.9	350	51.3	115-2200	L	G	A	7-3	12 1/4	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L61HV	...	G	CD	142	87 1/4	34	44x3	52x4	N
14534	4.5	455	60.0	148-2000	L	G	A	7-3 1/2	17 1/2	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	L61HV	...	G	CD	144	88	34	44x3	50x4	N
15779	4.5	505	66.2	163-2000	L	G	A	7-3 1/2	17 1/2	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	W61A	...	G	CD	144	88	34	44x3	42x4	N
16779	4.5	505	66.2	163-2000	L	G	A	7-3 1/2	17 1/2	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	W61A	...	G	CD	168	100	34	44x3	50x4	N
17555	4.5	555	72.8	180-2000	L	G	A	7-3 1/2	17 1/2	PC	Ha	Str	M	AL	AL	P. BL	Yo	Spl	Wls	...	Ros	W61A	...	G	CD	168	100	34	44x3	42x4	N
18262	4.7	176	33.7	73-2700	L	G	A	7-2 1/2	10 1/4	FP	No	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	31000H	Ros	L61HV	536	a	TX	168	102	31 1/2	38x2 1/2	52x4	N
19361	4.4	235	40.8	83-2400	L	G	A	7-2 1/2	13 1/4	FP	No	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	33000H	Ros	L61HV	536	a	FD	168	102	31 1/2	38x2 1/2	52x4	N
20393	4.4	235	40.8	83-2400	L	G	A	7-2 1/2	13 1/4	FP	No	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	33000H	Ros	L61HV	536	a	FD	168	102	31 1/2	38x2 1/2	52x4	N
21453	4.7	300	48.6	98-2200	L	G	A	7-3	14	CC	Ha	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	35000N	Ros	W61A	815	a	FD	192	120	33 1/2	42x3	56x4	N
22501	4.9	330	48.6	110-2200	L	G	A	7-3	12 1/4	CC	Ha	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	36020N	Ros	W61A	815	a	FD	192	120	33 1/2	42x3	56x4	N
23438	4.4	322	43.3	125-2400	L	G	A	1-2 1/4	10 1/4	FP	No	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	36020N	Ros	W61A	815	a	FD	192	120	33 1/2	42x3	56x4	N
24698	3.4	110	15.1	126-1850	L	G	A	7-3	10 1/4	CC	Bu	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	36020N	Ros	W61A	815	a	FD	192	120	33 1/2	42x3	56x4	N
25707	4.4	306	60.0	170-2000	H	C	A	7-3 1/2	11 1/4	FP	BS	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	36020N	Ros	W61A	815	a	FD	192	120	33 1/2	42x3	56x4	N
26707	4.4	306	60.0	170-2000	H	C	A	7-3 1/2	11 1/4	FP	BS	Zen	M	DR	DR	P. BL	Pe	Spl	Tim	36020N	Ros	W61A	815	a	FD	192	120	33 1/2	42x3	56x4	N
27820	5.2	300	44.4	130-2800	L	G	C	5-2 1/4	12 1/4	FP	Ha	Str	M	DR	DR	D. Fu	Ch	Spl	Tim	27045W	Ros	W61A	782	Da	CD	111 1/2	216	34	44x3	None	N
29420	5.2	300	44.4	130-2800	L	G	C	5-2 1/4	12 1/4	FP	Ha	Str	M	DR	DR	D. Fu	Ch	Spl	Tim	27045W	Ros	W61A	782	Da	CD	111 1/2	216	34	44x3	None	N
30462	5.2	300	44.4	130-2800	L	G	C	5-2 1/4	12 1/4	FP	Ha	Str	M	DR	DR	D. Fu	Ch	Spl	Tim	35000H	Ros	L61HV	523	a	CD	162	108	34	39x2 1/2	39x2 1/2	N
31462	5.3	300	45.9	98-2000	L	G	A	7-3	13 1/4	PC	Wa	Str	M	AL	DR	D. BL	Ch	Spl	Tim	35000H	Ros	L61HV	523	a	CD	162	108	34	39x2 1/2	46x3 1/2	N
32549	4.9	332	48.6	100-2000	L	G	A	4-3 1/2	11 1/4	PC	Wa	Str	M	AL	DR	D. BL	Ch	Spl	Tim	26045W	Ros	W61A	966	a	CD	162	108	34	48x3 1/2	53x4	N
33677	6.4	466	70.0	125-1800	L	G	A	7-3 1/2	16 1/4	FP	Wa	Str	M	AL	DR	D. BL	Ch	Spl	Tim	26045W	Ros	W61A	966	a	CD	162	108	34	48x3 1/2	53x4	N
34698	4.7	292	43.4	104-2300	L	G	C	7-3	13 1/4	FP	Ha	Str	M	NE	NE	P. Own	Ow	Spl	Tim	27045W	Ros	W61A	966	a	CD	162	108	34	48x3 1/2	53x4	N
36111	5.0	398	54.2	218-2200	L	G	C	4-3 1/2	11 1/4	PS	Ow	Str	M	RB	LN	P. Own	Ow	Cle	Ow	BX	Ros	O61A	1118	a	FD	192	109	33 1/2	54 1/2 x 3	48x3 1/2	N
37611	5.0	398	54.2	218-2200	L	G	C	4-3 1/2	11 1/4	PS	Ow	Str	M	RB	LN	P. Own	Ow	Cle	Ow	BX	Ros	O61A	1118	a	FD	192	109	33 1/2	54 1/2 x 3	48x3 1/2	N
38611	5.0	398	54.2	218-2200	L	G	C	4-3 1/2	11 1/4	PS	Ow	Str	M	RB	LN	P. Own	Ow	Cle	Ow	BX	Ros	O61A	1118	a	FD	192	109	33 1/2	54 1/2 x 3	48x3 1/2	N
39706	4.8	427	60.0	138-1900	L	G	C	4-3 1/2	11 1/4	PS	Ow	Str	M	RB	LN	P. Own	Ow	Cle	Ow	BX	Ros	O61A	1118	a	FD	192	109	33 1/2	54 1/2 x 3	48x3 1/2	N
41229	4.9	350	51.3	114-2200	L	G	A	7-3	14	PC	Ha	Zen	M	DR	DR	D. Fu	Ow	Blo	Ow	Wls	Ros	W61A	1034	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N
42707	4.5	460	60.0	150-2000	L	G	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp. BL	Yo	Blo	Ow	Wls	Ros	W61A	1034	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N
43779	4.5	460	60.0	150-2000	L	G	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp. BL	Yo	Blo	Ow	Wls	Ros	W61A	1034	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N
44555	5.0	576	72.8	180-2000	L	G	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp. BL	Yo	Blo	Ow	Wls	Ros	W61A	1034	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N
45282	5.0	576	72.8	180-2000	L	G	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp. BL	Yo	Blo	Ow	Wls	Ros	W61A	1034	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N
46282	5.0	576	72.8	180-2000	L	G	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp. BL	Yo	Blo	Ow	Wls	Ros	W61A	1034	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N
48282	5.4	262	43.3	92-2400	L	G	C	7-2 1/2	13 1/4	PC	No	Zen	M	AL	AL	P. BL	Lo	Cle	Tim	33020H	Ros	L61H	578	a	TD	192	101	34	40x2 1/2		





## SCHEDULE BREAKDOWNS are costly 347B helps you PREVENT THEM

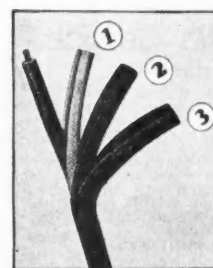
Keeping on the road hour after hour, day after day without costly interruption. That's the big job. A reliable ignition system is just as important in maintaining schedules as any other major item of your equipment — often more so.

Packard appreciates your problems because of its years of service in manufacturing ignition cables for truck and bus operation. Long experience, painstaking research, scientific design and faultless construction are responsible for the success of Packard Cable.

To minimize delay and frequent replacements, specify Super-Duty Packard — 347B. Packard Electric Corporation, Warren, Ohio.

### PACKARD Wins Again!

In the last six years 59 of the 60 cars to finish in the money at the Indianapolis Races have used Packard Spark Plug wires. Install the ignition cable found best by America's foremost race drivers.

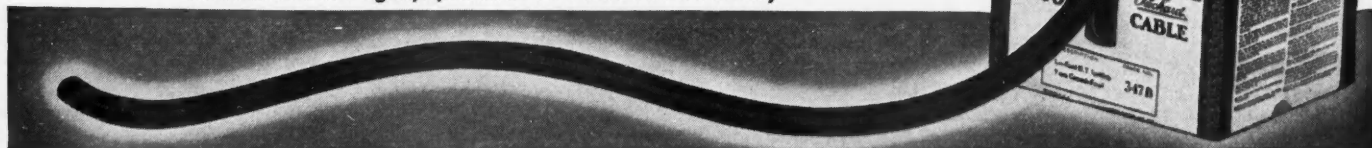


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Protected with  
Tri-ply Sheathing**

1. Lacquered cotton braid
2. Varnished cambric tape
3. Strong braid, multiple "Lac-Kard" processed

*Packard*  
REG. U.S. PAT. OFF.  
TRADE MARK

IGNITION CABLE • BATTERY CABLE • LIGHTING CABLE  
The Standard Wiring Equipment of the Automotive Industry





# KINGHAM INVITES COMPARISON!

THE SPECIFICATIONS SHOWN BELOW ARE FOR THE KINGHAM CHASSIS EF-2

## IN QUALITY

Rated Capacity .....	2 ton	Wheels .....	20 x 5
Maximum Payload .....	10,000 lbs.	Tires (regular) .....	30 x 5—6 ply, or 6.00 x 20
Frame Length .....	16' 0"	Brakes (B.K. double line) .....	15 x 2 3/4"
Frame Width .....	39"	Fifth Wheel (stationary) .....	24"
Frame Height .....	35"	Fifth Wheel (semi-automatic) .....	24"
Loading Height .....	44"	Front Deck .....	75"
Frame Size .....	3/16 x 10" web	Axle to End of Frame .....	38"
Cross Members .....	Full depth on all models	Lubrication .....	Alemite or Zerk fittings on all models
Number Cross Members .....	6	Paint .....	One coat primer—one coat lacquer
Drop in Frame .....	6"	Weights:	
Axle Capacity .....	7500 lbs.	Chassis .....	App. 1445 lbs.
Tread .....	6"	Chassis with Floor Sills, etc. ....	2340 lbs.
Spindle Diameter .....	2 1/2"	Fifth Wheel (semi-automatic) .....	200 lbs.
Bearings (Timken) .....	4553-3360	Fifth Wheel (stationary) .....	Add " 100 lbs.
Springs (slip joint flat end) .....	10 lf. x 3" x 46"	Landing Gear .....	Add " 225 lbs.
Helper Springs .....	5 lf.—3" wide	Brakes .....	Add " 220 lbs.
Axle (one piece tubular) .....	3 3/4"—unconditionally guaranteed against spindle breakage.		
Radius Rod .....	Round adjustable with bronze bushings on all models.		
Supports .....	Enclosed adjustable screw type roller bearings equipped (with wheels) on all models.		

## IN PRICE

EF-2 Chassis .....	\$245.00
Stationary Fifth Wheel .....	30.00
Brakes (B-K Booster—Double Line) .....	125.00
<b>Total</b> .....	<b>\$400.00</b>

If semi-automatic fifth wheel wanted add \$30.00 to above price.

If landing gear wanted add \$60.00. All prices quoted F.O.B. Louisville. No deceptive prices.

**MAKE YOUR OWN COMPARISON—YOU WILL BUY KINGHAM!**



TRAILERS, BODIES,  
WINCHES

KINGHAM TRAILER CO., INC.  
235 E. GAULBERT ST.,  
LOUISVILLE, KENTUCKY

# To Solve Your Cleaning Problems

No matter what your cleaning problem may be, you can solve it with a Wyandotte Product. Wyandotte Products have been developed to meet every cleaning requirement. They are produced by the world's largest manufacturers of specialized cleaners.

And Wyandotte also offers you the cleaning experience of its more than 350 service men. Jobbers and storage stocks are always near you.



**The J. B. FORD COMPANY**

**Wyandotte,  
Michigan**

THE J. B. FORD CO.

Wyandotte, Michigan

My cleaning problem is:

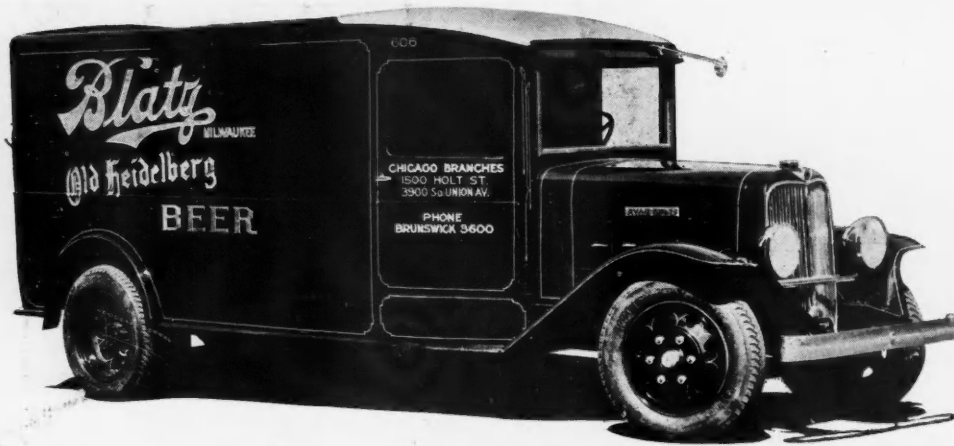
Name .....

Address .....

City .....

State .....

Dept. J-3



BLOOD UNIVERSAL JOINTS take absolute care of your maintenance problems.

Twenty-eight years constantly serving the Truck Industry.

## QUALITY UNIVERSAL JOINTS

AVAILABLE TRUCK MODEL W-140. CAPACITY 2-TONS. One of a fleet recently sold to Blatz Brewing Co., Chicago and Milwaukee.

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1904

BLOOD BROTHERS MACHINE CO.

Allegan, Michigan



### MARMON-HERRINGTON



World's Most Advanced  
All-Wheel-Drive Trucks

**\$2250** and Upward, f.o.b. Factory;  
21 Models, 1½ Tons and Upward

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### LUCE MASTERCRAFT

TRUCK BODIES

Production  
and  
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Body Equipment  
Vocationally Designed  
LUCE MANUFACTURING CO.  
Lansing, Michigan

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ON or OFF IN 10 SECONDS



THE STANDARD EQUIPMENT HOSE CLAMP AT DEALERS OF THE AUTO-MOTIVE AND AIRPLANE INDUSTRY EVERYWHERE

WITTEK MFG. CO. 4307 W. 24th PLACE CHICAGO, ILLINOIS

### COURT DECISIONS

(CONTINUED FROM PAGE 33)

#### Competing Certificates Okay

*Texas Motor Coaches, Inc., v. Railroad Commission et al., Texas Court of Civil Appeals.*

THE fact that the new certificate granted to the motor carrier proposing to compete with an established carrier may result in financial loss to the established carrier will not preclude its issuance. The interests of the motor carrier in a field are subservient to the public convenience and necessity. Whether the public convenience and necessity will be served by the granting of new application or not is a matter for determina-

tion of the Commission. Where existing carrier made no offer to furnish the added service, it was not in a position to complain when it was denied the opportunity to furnish the service.

#### Leased Trucks Need Permit

*Reavley v. State, Texas Court of Criminal Appeals.*

AN operator of a truck leased to transport property for compensation must obtain a permit from the Texas Railroad Commission. Conviction of Reavley, who had leased a truck owned by him to Armour & Co., was upheld. He was fined \$125.00. He contended that the truck was used exclusively by the company for hauling its own products.

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Manufacturers of

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A quality ring without a gap, which provides flexibility, unequalled compression and perfect oil control.

Especially suited for truck, tractor and bus service.

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The court held that this was merely a device which enabled him to use his truck in transporting property for hire without compliance with the statutes.

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